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*to Mrs. J. A. Aged
with Compliments
of
Henry Bruère*

AN INVESTIGATION

OF

TRADE AND INDUSTRIAL SCHOOLS

CONDUCTED FOR THE

**International Harvester Company
of America**

BY

HENRY BRUÈRE



**PUBLISHED BY
THE INTERNATIONAL HARVESTER COMPANY OF AMERICA
CHICAGO, ILLINOIS.**

1904.

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PREFACE

I wish to acknowledge my indebtedness to the authorities of the several institutions, described in the following reports, for their courteous co-operation in providing me with information concerning their work.

With the exception of statements taken from the catalogs and reports published by the schools, all the facts upon which these reports are based were gathered from visits of one or more days, to the schools and institutions themselves. The article on Factory Education, found in the appendix, is reprinted through the courtesy of the Editor of *The Commons*.

HENRY BRUÈRE.

Chicago, July, 1904.

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CONTENTS.

PART I.

SOUTHERN INDUSTRIAL TRADE SCHOOLS.

	PAGE.
Letter to Mr. John G. Wood - - - - -	4
Introduction - - - - -	5
Report on Berea College, Berea, Ky. - - - - -	7
Report on Atlanta University, Atlanta, Ga. - - - - -	9
Report on Spelman Seminary, Atlanta, Ga. - - - - -	12
Report on Tuskegee Institute, Tuskegee, Ala. - - - - -	12
Report on Home Industrial School, Asheville, N. C. - - - - -	19
Report on Hampton Institute, Hampton, Va. - - - - -	20

Chicago, Ill., July 8, 1904.

Mr, John G. Wood, General Superintendent, McCormick Works, International Harvester Co.

Dear Sir:—I hand you herewith reports upon the educational work conducted at the several Southern Institutions, which I visited during my recent investigation of Industrial Schools.

These reports cover the work of Berea College, in Kentucky, several institutions in Atlanta, Ga., Tuskegee Institute in Alabama, the Asheville Home School, in Asheville, N. C., and the Hampton Institute, in Hampton, Va.

These schools group themselves naturally in so far as they have to do, primarily, with the education of backward people, either white mountaineers, Indians, or the southern Negro. It will be seen that the purpose of these institutions is to develop from the ranks of unskilled workers, artisans and teachers who shall be of service in raising the tone and economic efficiency of the several communities from which they are drawn.

The second group of institutions has to do with developing special skill and peculiar efficiency in workmen who live in communities industrially more advanced. This group comprises institutions located north of Mason and Dixon's line.

No attempt has been made in these reports to discuss in any way thoroughly the economic conditions which have given rise to the foundation of the schools. On the other hand, it has been assumed that they were meeting actual conditions and an effort has been made, merely, to describe their activities as fully as possible.

It is hoped that by reviewing the work of these institutions the wisdom of developing the industrial educational side of our "Institute" will make itself clearly felt.

Respectfully submitted,

HENRY BRUÈRE.

901 West Twenty-second Street.

INTRODUCTION.

Industrial education in the South is devised to meet a two-fold need, one primarily social, and the other individual. In the first place, the South needs artisans and skilled workers, who are ready to live under Southern conditions, and will accept less wages than the workmen brought from the North. Burdened with a slowly developing race foreign to them, the Whites of the South are eager to find some solution of the many problems arising from the existence of a large number of Blacks amongst them, who cannot be raised by a process of assimilation, that great principle of development upon which, in the face of the constant wave of immigration of uneducated and largely unskilled people from the lower strata of European civilization, the maintenance of American methods of life and thought are dependent. To find the principle of self-development for the Negro is the aim of the leaders of the Black race, and its discovery is the growing concern of those Southern Whites who do not believe that the welfare of the South hangs upon keeping the Blacks in a condition of dependent inferiority.

The old idea of educators was that illiteracy and ignorance of any form of culture was the largest difference between the people who had attained economic proficiency under slavery and the representative white men who had taught them habits of industry. In an agricultural country such as the South, mere application and steady work develops sufficient skill for the raising of successful harvests, and where labor is as abundant as it is in the South, no special need exists for the training of agricultural laborers. If the Negro could be taught to read and write, and the elements of Christianity, it was thought, he would find opened to him the opportunity for a fuller development of whatever powers he might possess, and on the other hand, in a state of freedom, he was less likely, educated, to prove a danger and menace to Southern civilization.

Education had become a fetish which, especially in the North, was supposed to be the great panacea for social difficulties. What kind of education was not the question. *EDUCATION* was enough—to read and write, to know this or that truth or half-truth; while to necessity and competition was relegated the task of training men for economic service. The humanitarian and public-spirited Northern Whites regarded education as the great need of the ex-slaves and their children, and made generous sacrifices to provide them with schools and colleges.

In the second place, the Negro looked upon education as the barrier between him and his white neighbor. He saw that the educated man was not likely to work, or if he worked he received special emoluments and distinction as a member of the professional or mercantile classes. If the Negro were ambitious, and not resigned to a servile condition by long years of comfortable slavery, he sought freedom from drudgery or entrance into the professional ranks by means of acquiring the magic power of reading and writing. The result was that schools that had been devised for a race of men, and a condition of civilization, in which every child was to be given an equal chance for attaining the highest social or economic positions in the community, were established for the Negro. The Negro was to be given "an equal chance" to make *his* way, and so, wherever the South acquiesced, or money could be provided, schools were opened. This education failed to meet the expectations of its devotees. There are still a few persons in the South, the greater part of whom are Negroes, who believe in the efficacy of literacy as an instrument of civilization. But where faith in education remains, it is in education of a new order, in educative training to a definite end rather than in an educative process which seeks, merely, to awaken intel-

ligent interest in a comparatively wide range of information. (That is, rather than in a mere educative process which informs but does not develop aptitudes nor awaken them.)

Almost accidentally, in the effort to make Negroes valuable members of the body politic, the educators of the South have discovered a new principle of education, from which a reformation of the general Northern idea of the purpose and ideal of our educational system is likely to follow. It is a singular fact that while we zealously devote our energies and lives to economic practices, our education has been of a nature which primarily aims to relieve a man of work as such; that is, which in its origin assumed that educated men would find in their knowledge a full occupation of their powers, that men who were learned would use their knowledge as a means of livelihood, or because of the possession of an education would be suffered to exist as economic parasites.

Before the Renaissance, education set men apart from the common mass and, to the common man, the life of the learned was the kind of life for a man to seek. On the awakening of a democratic spirit which reached down to the middle class, the educated man, half coerced, half from motives of philanthropy, devised means of letting the vulgar into their precincts, as far as the vulgar could afford to come. With the increase of numbers within the ranks of the educated, there naturally resulted a compromise with the common necessity for labor. Society could no longer afford to allow every educated, or partly educated man, to spend his days in the pursuit and delight of knowledge. Learning and labor were made to co-exist. This was a condescension on the part of learning, but a necessity for the sake of living.

Mankind has never thoroughly awakened from the half-illusion that education means happiness. Where we are most civilized, there every child is made to acquire at least a modicum of learning which, until recently, was merely book-learning. We take our education and turn to toil, usually as an escape from the stupid routine of the common school.

The Negroes repeated the error of the Whites, but they are recovering themselves from their mistake. They are learning that mere education, in itself, does not furnish a man with a living wage, and that to secure a living wage a man must render indispensable service to the community in which he lives. While he is at school he must be taught to do those things for which the community is willing to give him wages in return. For the Negro in the South it is necessary that he learn how to use his hands in a skillful fashion, because the white South does not wish the service of the Negro in the learned professions nor, to any great extent, in a clerical capacity. These facts bear upon the lives of the black men in an important way because it is to the white employer or landlord that the Negro must look for an opportunity to exercise his skill. The South wishes to employ the Negro as a mechanic or farmer, and if he can render skilled service in positions of this character it will reward him adequately. The Negro has learned that he cannot foist himself upon the older race, simply because he can read or write as well as his white neighbor, but that he must be prepared to yield the community such service as it demands of him. In order that he may do this successfully schools have been established for his industrial training, and the results which they have produced in raising the tone of the Negroes whom they have trained, and in equipping them for useful careers as artisans and substantial citizens, have won for them, both the confidence of the Black race and the respect and support of the Whites.

The representative schools of this type are the Tuskegee Institute, in Alabama, and the Hampton Institute, in Virginia. The importance of their work will readily be understood from reading the description of their activities in the following pages.

PART I.
BEREA COLLEGE.

Berea, Ky.

There is, at present, wide-spread interest in a law, passed by the Kentucky Legislature at its last session, prohibiting the co-education of the colored and white races by any institution, public or private, having its charter from the State. This law will affect an important educational institution situated in the western margin of the Kentucky mountain region notorious for family feuds and moonshine distilleries. Indeed, it is believed that the law was aimed directly at this institution. At any rate, it is Berea College, which will carry the act before the Supreme Court on the grounds of unconstitutionality.

Berea College was founded before the war, for the support of unionism in the South, and for the promotion of the cause of free speech. Cassius Clay, a distinguished journalist of ante-bellum times, discovered in the mountain people, who were landholders without being owners of slaves, a possible outpost of the anti-slavery movement. The founders of the college met with vehement hostility on the part of these mountain people who, although unionists were anti-Negro, for the doors of this institution were immediately opened to the black folk.

But it is not as an institution for the education of Negroes that Berea College is significant. Not more than 10 per cent of its 1,000 students are Negroes, and most of these come from some distance. Its important work lies among the mountain folk themselves, for whom it is the outpost of civilization.

These mountain folk spread over the Appalachian Plateau in eastern Kentucky, Tennessee, western Virginia and North Carolina in the westward movement of population occurring after the Revolutionary War. By mere accident they came into a country which was without the main channel of migration, a region unconnected by highway or water-course with the western lowlands. Isolated here these people have remained in the stage of development to which their great-grandfathers had attained; they practice the household arts of weaving, dyeing and spinning; they use open flambeaux for lamps; they do not read or write; they live in log cabins of their own making, and dig a precarious livelihood from the exhausted hillsides.

The State has left them to their own devices. No compulsory education law required their children to grow out of the depth of their parents' ignorance. There are no means of communication over wide stretches of territory, save the beds of creeks and the saddle horse. Newspapers are just commencing to work their way among the people, but in places there is not a printing press to be found throughout five counties.

Until recently schools were maintained only during the three summer months; now a five-months' term is required by law, but no child is forced to attend school, and a great many do not. The children are numerous, the people being barbarously prolific, consequently the population increases steadily while the standard of life is correspondingly lowered.

I came in contact with a number of the mountaineers both at the school and out in the hills. They are a strong, handsome people, Scotch-Irish and English in blood; in every respect splendid material

for American citizenship. During the Civil War their qualities asserted themselves. Both in the Union army and among the Confederates they won the reputation of first-class fighting men. In the great war these "backward frontiersmen" supported the government which their grandfathers had fought to establish.

Among these people Berea College exists as a great social settlement. In Berea, children over 15 years of age are taught the elementary branches; older boys and girls, with the necessary preliminary education, are prepared to go back among the mountains to teach again what they learn at Berea; and a small handful are given the regular academic training and sent out into the world. But the aim of the institution is to equip the mountain girls and boys for continued life and service among the mountaineers; to send back to the hills educated men and women who will gradually lift the mass of the people out of ignorance without destroying their virile originality. No effort is made to vulgarly americanize the mountain folk; they are encouraged, on the other hand, to continue their weaving and rug making and to remain contented with their log cabins and crude conveniences. No more commendable effort is being made anywhere to join education with simple, dignified, wholesome living.

Berea makes it possible for anyone to secure an education. A native told me a lad may come from the mountains with two or three dollars in his pocket, which to him is a very large sum of money, and find the doors of Berea open to him. But he is made to pay his way in work. He may earn his board in the college brick-yards, or in the college lumber camp, coming to school at night, or working and attending school alternately; or he may pay his way in part by service about the college buildings. The tuition is nominal and the cost of living low.

Girls are not only taught to teach, but also taught to make good housewives. They learn sewing, dressmaking, cooking, laundering and nursing at Berea, as well as mathematics and history. Boys are taught forestry and various trades. A man may come to Berea an illiterate mountaineer and return, no longer illiterate, but still a mountaineer.

The mountains all about are covered with timber, and vast stores of coal lie under the soil. Here and there outside capitalists have made inroads into the country and are shipping out great quantities of lumber and coal. Forest land is now selling at \$10.00 to \$17.00 per acre which five years ago could have been bought for 50 cents. Berea College is making an effort to keep the hills in the hands of the mountaineers. Through its agriculture department it teaches the elements of forestry to the boys, and by its publications and extension work it communicates this intelligence directly to the mountaineers.

This extension work deserves conspicuous notice. Men instructors and advanced students in the school journey about on horse-back, teaching history or civil government, and giving stereopticon lectures to the isolated mountain people; and so the strands of intelligent influence are spread to the remote corners of the region. New students come in from outlying districts, learning in this way of the existence of the college, and the sphere of its influence is thereby constantly widened.

The educational problem at Berea resembles the problem of educating factory workers in that it is, primarily, a problem of adaptation. A great many of the students come for only three months in the year, or for one year, and for these Berea must provide means of effective suggestion. Classes in the grades are composed of men and women, black and white, together with young girls and boys. I visited a class in geography where the ages varied from 15 to over 30 in a group of 23 pupils. This wide variation in ages did not represent a difference of intelligence, but, merely, a contrast in opportunities.

On the industrial side of the school the instruction is made absolutely practical throughout. In the laundry the girls wash their own clothes

and the school linen. In the carpentry and bricklaying departments the students actually build the school buildings. In the early manual training classes the Sloyd system has been adopted, so from the start every piece has a practical as well as an educational value.

The work of making active and influential American citizens of the backward and unsocial mountain people is entirely in the hands of Berea and other institutions of learning. These people are self-sufficient. They are far from the pressure of immigration, and it is for them to determine what direction their lives shall take. Their first economic problem is to keep their hills in their own hands, and their second, to learn modern methods of intensive farming so that the lands which they have carelessly tilled for years shall be renewed in productiveness. It will be a refreshing thing to come among these mountain people in after years, finding them wide-awake American citizens, but untempted by the cheap attractions of our American city life; contented to live simple, free lives in their blue grass mountains.

NOTE—The isolation of some of the Mormon communities in the far west serves to confirm the impression that the mountain people will advance without the difficulty and danger of absorbing new blood. On the other hand, the long years of close intermarriage may render the importation of new blood desirable whenever the people acquire self-consciousness and set for themselves a social ideal in any way as dominating as the religious organization of the Mormons.

ATLANTA UNIVERSITY.

Atlanta, Ga.

The Atlanta University is an institution for the higher education of Negroes. It was founded in 1867 by Northern friends of the Negroes, and now, as then, derives its main income from Northern contributors. The institution comprises a high school, a regular college course, a normal course, and a technical course. For the year 1903-04 there were 273 students enrolled. Of this number there were 2 graduate students, 7 members of the senior class in the college course, 25 members of the senior class in the normal course, a total of 48 in the college course, with a freshman class of 19, a total of 34 in the normal course and 191 in the high school course. The high school course covers a period of three years. In the first year class there were 94 students, while in the third year there were only 40, showing a decrease of 54 in two years, or over 57 per cent.

Of the whole number of students, 92 were boys and 181 were girls. Of these 127 were boarders and 146 day pupils, representing 29 different counties in Georgia, and 13 different States.

Since 1876 there have been 462 graduates from the institution. Of this number 117 were graduates from the college course, 347 from the normal course. Of the total number of graduates, 111 were males and 251 were females. There are living, 91 males and 314 females. Of these 405, 241 or 59.05 per cent, are teachers; 1 is engaged in literary work; 3 are students; 6 are engaged in religious work; 15 in the government service; 11 are undesignated; 108 or 26.7 per cent, are married women with no occupations. There are no artisans in the number; 2 superintendents of housework; 1 nurse and 2 dressmakers. The apparently significant facts showed by these figures are the large percentage of the graduates who go into teaching as a profession, and the absence of manual workers from the whole number. Here, at any rate, higher education has opened opportunities of brain work as a means of livelihood to men and women who must, otherwise, have had to perform menial or manual labor to earn a living. It is stated that those who

attend the university for several years but who do not graduate are also likely to go into teaching as a profession, so great is the demand for Negro teachers for Negroes. The university lays especial emphasis upon the function of teacher training. It offers, in its own words, "an exceptional education for exceptional Negroes to prepare for service among the ignorant and needy masses."

The industrial departments, with the exception of the housekeeping and domestic science courses, are not designed to prepare students for industrial work, but are intended to train industrial teachers. For the men, the shop work resembles the instruction in the manual training schools. One year is devoted to wood-working; one-half year to forging; one-half year to mechanical drawing, including architectural and machine drawing.

WOOD-WORKING.

In the bench room are twenty benches and vices; each bench being fitted with a case of wood-working tools, squares, planes, chisels, gauges, saws, hammer, mallet, bits and brace, draw-knife, dividers, oil-stones, etc., and with twelve wood-turning lathes. All boys begin their industrial work here (a good many with reluctance at having to do manual labor), and are instructed in the general principles of wood-working: Marking, sawing, planing, boring, chamfering, mortising, tenoning, grooving, mitering, beveling, and dovetailing. All students are advanced through a carefully graded series of exercises which are fully shown by working models and drawings. Wood-turning is introduced in the latter part of the year.

IRON-WORKING.

In iron-working the students are taught the correct ways of boring, turning, drilling, tapping and finishing iron and steel; the use and care of machines and machine tools; the use and care of engine and boiler.

MECHANICAL DRAWING.

In mechanical drawing the student is taught the use and care of instruments; orthographic projections; including surfaces, intersections, development of helical curves and screw threads; and arbitrary methods of representing screws, bolts, tapped holes, etc. A short course in machine drawing includes the draughting of parts previously sketched. The course in architectural drawing consists in making plans and the necessary details for a house. This course often proves of practical benefit to teachers going into poor communities where their knowledge of architectural drawing, while elementary, serves them in building school houses and cabins.

Among the women the industrial work is of more immediate practical value. Instruction is given to all girls in the high school and normal courses in sewing, dressmaking, cooking and household management, the more advanced work being supplemented by residence and practice in a Model Home.

SEWING.

First Year—72 hours. Instruction is given in basting, running, back-stitching, overcasting, hemming, oversewing, French seam, outlining, patching, felling, gusset, napery stitch, combination stitch, tacking, gathering and binding buttonholes, and hemming and whipping ruffles. Pillow cases and aprons are made.

Second Year—72 hours. Different kinds of darning, drafting, cutting and making undergarments, and plain machine work. Girls may buy garments at cost.

Third Year—60 hours. Dressmaking. Students are expected to be prepared to buy a chart for drafting; also to buy an inexpensive woolen dress, lining and trimmings for practical work.

COOKING.

Third Year—60 hours. The care and management of a fire, the structure of a stove, the washing of dishes and cleaning of boards and closets are given careful consideration. The chemistry of cooking is illustrated by simple experiments, and then given practical application in the cooking of eggs, meats, cereals, batters, doughs, soups, etc.

The Model Home was erected in 1899 from contributions from the King's Daughters, and several individuals. It contains rooms for the accommodation of 17 persons, who carry on all the work of the house without the help of servants, and is equipped with modern appliances for teaching cooking.

Atlanta University aims to develop leaders among the Colored race, leaders by reason of larger culture and more rigorous moral character. The graduates are leaders in temperance organizations, sociological associations and teachers' clubs, and are found in the front ranks of every social reform movement. In a large measure they are moulders of public sentiment, and are helping in a quiet way to solve the perplexing problems of the Negro race in the South. Although they are reformers in the best sense of the word, they are an eminently conservative social element.

A very important part of the work of the university consists in the study, by the department of sociology, of institutions and social problems among the Negroes. After an investigation has been conducted by the university, conferences are held for the discussion of the data which has been accumulated. Studies have been made of "The Negro in Business," "Mortality Among Negroes in Cities," "The College-bred Negro," "Some Efforts of American Negroes for Their Own Social Betterment," "Crime Among Negroes," "The Negro Artisan," etc. These studies have elicited wide-spread interest and received the commendation of leading journals and reviews, both in America and abroad. The *Boston Herald* of February 23, 1903, says in an editorial: "It is not easy to estimate too highly the series of yearly reports that are coming from Atlanta University relative to the condition of the Negro population of the country. They are social studies that treat of matters about which there is to be found nowhere else so carefully gathered and trustworthy information."

The university is controlled by whites, and the majority of the faculty are white, although in the faculty there is a Negro who, in many respects, is the leader of his race in America. Who, at any rate, shares the leadership in the Negro mind with Booker Washington, a man of fine training, keen intellectual attributes and splendid loyalty to his race, Dr. W. E. Burghardt Du Bois.

The following are some excerpts from miscellaneous suggestions to students, published in the annual catalog of the university:

Each pupil should bring a Bible.

All should be provided with warm clothing.

Young women must have rubbers and waterproofs.

The use of silks, velvets or other expensive or showy materials or trimmings is prohibited. Prints, ginghams and plain worsted, with inexpensive lawns and muslins for hot weather, are the most appropriate wear.

No extra dress is required for graduation. Experience has taught that much evil comes from pupils receiving food or large quantities of fruit or candy from home or friends. They are, therefore, not allowed to receive it. Friends will please not send it.

Letters should be directed to the care of the university.

Keeping or using firearms on the premises is forbidden.

Students should arrange so as not to travel on the Sabbath, and friends are earnestly requested not to call upon them on that day.

It is desired to make the school, as far as possible, a home for those who attend. Not only their intellectual, but also their physical, social, moral, and religious culture receives careful attention.

SPELMAN SEMINARY.

Atlanta, Ga.

Spelman Seminary is a Baptist school for Negro girls. It occupies a group of buildings on the outskirts of Atlanta, Ga. The school was founded in 1881 under the name of The Atlanta Baptist Female Seminary. In 1883 the name was changed to Spelman in honor of the parents of Mrs. John D. Rockefeller. Since 1888 Mr. Rockefeller has been one of the trustees of the institution, and has invested large sums of money in its buildings and grounds.

The whole number of students for the year 1903-1904 was 650. Of this number 336 were boarders and 314 day pupils; 259 were under 16 years of age; 345 between 16 and 25 years of age, and 46 over 25 years of age; 97 girls took cooking in addition to academic work; 16 cooking exclusively; 6 took printing exclusively; 5 music exclusively; 16 nursing exclusively; 15 dressmaking exclusively; 23 of the students came from Georgia; 117 from 16 different States, while 10 came from South America, the West Indies and Africa.

Spelman is essentially a Christian institution. Religious work of one sort or another is an important part of the school's activity.

The industrial courses at present given in the seminary are: Sewing, dressmaking, basketry, printing, and agriculture (dairying, truck-gardening, poultry-raising, etc.). Of these, printing and dressmaking are elective, the others have definite places on the general program. Millinery will be introduced next fall.

Spelman deserves notice because it is an institution which aims to make cheerful workers, who will look upon every kind of labor as honorable. As an educational institution it must be classified among those establishments, which entered the difficult field of Negro betterment in the South, with a larger share of missionary spirit than educational interest. It is not so much concerned with the solution of the general economic problems, which perhaps are the most difficult for the Negro of to-day, as with the cultivation of private morality. It assumes that a woman of Christian training is likely to be a serviceable woman in whatever community or condition of life she may find herself.

TUSKEGEE INSTITUTE.

Tuskegee, Ala.

Tuskegee aims to meet some very practical economic problems through the courses of instruction offered to its 1,800 Negro students. Unlike the Atlanta University and Spelman Seminary, its primary purpose is not to develop exceptional men and women, but to raise the standard of the average Negro. While Tuskegee began as a normal school, and although the normal department still occupies an important place in its work, the character of the institute is peculiarly industrial.

The school is situated near the middle of the State of Alabama, in a county where the blacks outnumber the whites five to one, on the northern

edge of the great black belt, reaching from the Mississippi River to the sea, in which the Negro population is numerically preponderant. Its declared object is to furnish "the young colored men and women an opportunity to acquire through moral, literary and industrial training education, so that when they go out from Tuskegee, by putting into execution the practical ideas learned there, they may become the real leaders of their communities, and thus bring about healthier moral and material conditions. The institution also aims, through the Phelps Hall Bible Training School, to better fit young men and women for the ministry and for other forms of Christian work.

"The constant aim is to so correlate the literary and industrial training, that a student cannot get the one without the other."

Of the work in the academic department the catalog makes the following statement: "The laborer must not be regarded as a mere machine, capable of greater productiveness; he is a man responsive to ideals; he is a man for whom we seek wider spiritual margin. It is good for Negroes in the New South to be artisans, not merely because like plows and hoes and horses they will be useful, but because like men they will live more wholesome lives." The special business of the academic department is to enlarge the lives of men and women, but an enlarged life is essentially a more useful life.

All instruction in the academic department is closely correlated with the work in the trades. "Every effort is made to secure a genuine co-operation between the instructors of the academic department and those of the industrial. Interest in physics is aroused and sustained when the academic instructor takes his class to the machine shop to see the industrial applications, the utility of science; a lesson in chemistry is fixed by a study of bread-making in the kitchen." This plan is good for physics and chemistry and good for tool-making and baking.

I shall advisedly avoid a discussion of the economic situation in the South. The fact that the Negro constitutes over one-third of the population cannot be ignored. The mass of this number is dependent upon wages for a livelihood, either as agricultural laborers, or artisans, or unskilled laborers in towns or cities. The Negro furnishes the bulk of the labor of the South. Upon his capacity for effective work the development of that great region very largely depends. By far the most important training for the Negro is in agriculture; by acquiring skill as farmers the race will increase its holding of land and thereby develop a stability which it can never possess so long as it has nothing at stake but a haphazard livelihood, which may be won here as well as there.

"In laying special stress upon hand training for a large proportion of my race," writes Booker T. Washington, in his annual report to the trustees of the institute, "I ask no peculiar education of the Negro because he is a Negro, but I would advocate the same training for the German, the Jew, or the Frenchman, were they in the same relative stage of social development as the masses of the Negroes. * * * We have borne in mind that the main emphasis should be laid upon training in agriculture, since the institution is located in the midst of a people, the great majority of whom depend upon cultivating the soil for a living. * * * Again, since the South is so new in its manufacturing development, we have also put great emphasis upon teaching the young men the mechanical industries most in demand in the South."

It is the industrial education of the Negro which has won favor in the South for his development. "A large element of people at the South favor manual training for the Negro because they were wise enough to see that the South was largely free from the restrictive influences of the Northern trade union; and that such organizations would secure little hold in the South so long as the Negro kept abreast in intelligence and skill of the same class of people elsewhere. Many

realized that the South would be tying itself to a body of death if it did not help the Negro up." Notwithstanding the fact that the number of immigrants arriving in the United States in the year 1902 was very nearly one million, practically none went into the southern States; to be more exact, the records show that in 1902 only 2,278 all told went into the States of Alabama, Arkansas, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Virginia. One ship sometimes brings as many to New York. Foreigners avoid the South, and the South is more and more realizing that it cannot keep pace with the progress of other parts of the country if a third of its population is ignorant and without skill. "The South must frankly face this truth, that for a long period it must depend upon the black man to do for it what the foreigner is now doing for the great West."

An educational institution, no matter how splendid its aspirations, makes headway only by its results. Tuskegee has won a great many friends and found a large number of generous supporters, not only because it set out to raise up the Negro, but because it has in so far as its influence has been directly felt, succeeded in doing so.

Rev. R. C. Bedford (white), the secretary of the board of trustees, told me that although a very large proportion of the students of the institute are compelled by financial reasons to leave the school before finishing the course, in nearly every case where a student has spent as much as six months at the institution it has been the means in a large degree of revolutionizing his life. "We are constantly surprised," writes Mr. Washington, "at finding students, whom we had almost forgotten, engaged in doing effective work as teachers, farmers, mechanics, or housekeepers, and in other forms of labor."

In an article in the *World's Work* of August, 1903, Mr. Washington presents data showing the great progress made by the graduates of the institute, and the service to education rendered by graduates, who, going back into their native sections with the "Tuskegee spirit" of service to their fellows, establish there smaller industrial schools which serve limited sections as Tuskegee is serving the entire South.

Tuskegee was established under the name of the Tuskegee State Normal School, by an act of the Alabama Legislature, session of 1880, appropriating \$2,000.00. The institution was opened for its first session July 4, 1881, in a rented shanty church, with thirty pupils in attendance, with but one teacher, Booker Washington (graduate of Hampton Institute). In 1883 the appropriation was increased to \$3,000.00, and in 1893 the institution was incorporated under the name of the Tuskegee Normal and Industrial Institute. During the first session of the school, the present location, consisting at that time of 100 acres, with three small buildings, was purchased by Northern friends.

To-day the property immediately belonging to the school consists of sixty-two buildings, twenty-six hundred and thirty-one acres of land, eleven hundred head of live stock, and more than sixty wagons, carriages and vehicles of various kinds. The endowment and the estimated valuation of the equipment and property of the institute exceeds one million seven hundred thousand dollars. Of this sum Mr. Carnegie has recently given six hundred thousand dollars.

Since 1881 the total number of students who have been wholly or partly through the course, that is, who have been enrolled and have remained long enough to be helped in any degree, is about six thousand. Thousands of adults are reached and helped each year through the Annual Tuskegee Negro Conference, with its various local conferences which meet annually; through the Mothers' Weekly Meetings, and the plantation settlement work conducted by Mrs. Washington. In addition, farmers' extension leaflets are edited at the Tuskegee Institute, and scattered broadly throughout the entire South. In the main, those who go out, (1) follow the industry they have learned, (2) teach in a public or

private school, or teach part of the year and farm or labor the rest, (3) follow housekeeping or other domestic service, or (4) follow a professional or the government service, or become merchants.

"After diligent investigations," said Booker T. Washington, "I cannot find a dozen former students in idleness. They are busy in school rooms, field, shop, home or church. They are busy because they have placed themselves in demand by learning to do that which the world wants done, and because they have learned the disgrace of idleness and the sweetness of labor. One of the greatest embarrassments that confronts our school at the present time is our inability to supply any large proportion of the demands that are constantly coming to us from the people of both races, North and South, for our students. But aside from their skill what has made Tuskegee men and women succeed is the spirit of unselfishness and the willingness to sacrifice themselves for others instilled into them at Tuskegee."

Before entering into a description of the trade instruction given at Tuskegee, I wish to say a word about the management and discipline of the institute. In the first place, the institute is governed by Negroes except in so far as certain white men are active in the board of trustees. The institute proper, however, is entirely in the hands of colored men and women. There are 110 officers of instruction and administration, a large number of these are graduates of leading colleges. A great many are graduates of Hampton, or of Tuskegee itself. Admission to the school requires ability on the part of the student to understand addition, subtraction, multiplication, and division, and ability to read and write. Applicants must be fourteen years of age, of good physique, of good moral character, and must bring at least two letters from reliable persons in their communities.

The night school is designed for young men and women who earnestly desire to educate themselves, but who are too poor to pay even the small charge made in the day school. Students who are able to pay all or the greater part of their expenses in cash are not admitted to the night school. They attend school in the day time, for four days each week, and are required to work only six days in the month, one school day in each week and every other Saturday. Applicants for admission to the night school must be sixteen years of age instead of fourteen, and physically able to perform an adult's labor. Cripples are under no circumstances admitted to this department.

The expenses of students are very low. Tuition is free to everyone. A maximum charge of \$10.00 is made for entrance fee and books. Lodging, fuel, board and laundering are charged for at the rate of \$8.00 per month. Against this charge a student, by diligence, may have credit for \$1.50 to \$3.00 given for labor performed for the institute. Night school students, except those in the tailoring, shoe-making and sewing divisions, as a rule, are allowed to work out at least all of their board for the first six months, and after that a night student may earn as much as he has capacity for, but no student is paid more than \$12.00 per month in excess of his board, and no part of a student's wages is paid in cash, except that those who work at Marshall Farm (about three miles from the institute grounds), are permitted to draw \$2.00 per month. Whatever a night school student may earn in excess of his board is placed to his credit, to be used for his expenses after he enters the day school. With a good outfit of clothing, \$45.00 or \$50.00 in money is sufficient to carry an industrious student through a term of nine months in the day school.

Both boys and girls are required to wear uniforms, which cost from \$4.25 to \$6.00 for women, according to the season, and \$10.00 for men. Military drill is required of all male students, who are under the charge of a commandant; but no firearms are used, or allowed on the premises.

Regular attendance at religious services is required. The use of

tobacco, liquor, dice and card playing are prohibited. Students are not permitted to take part in any political mass meetings or convention. Letter-writing is subject to regulation, and all mail and express packages are inspected and contents noted. Low or profane language will subject a student to severe discipline. Students are liable to reprimand, confinement, or other punishment. Modern bath houses are provided for both sexes, and regular bathing is enforced.

The spirit of Tuskegee is military. A strong effort is made to cultivate the habit of respect among young Negroes for their elders and for the members of the faculty. Free and natural social intercourse is permitted between young men and women, but every effort is made to have such relations remain pure-minded. Young men are taught to respect young women as a class, and young women to care for their persons and to cultivate a decorous behavior. The esprit of the institution is especially encouraging. There is a strong desire apparent among faculty and students to contribute to the success of the school and cultivate the opportunities for raising the standard of life among the blacks. There is inevitably an air of self-conscious approval in the bearing of a great many of the students; but the faculty are, in so far as I met them, simple and sincere workers for big ends, and not without modesty in the estimate of their services. On the other hand, manly bearing among the men and personal dignity among the women are almost the first results of residence at Tuskegee.

INDUSTRIAL EDUCATION.

The following trades are taught at Tuskegee: Architectural and mechanical drawing, blacksmithing, brick-making, carpentry, canning, electrical engineering, founding, harness-making and carriage-trimming, machinery, painting, printing, saw milling, steam engineering, shoe-making, tinsmithing and wheelwrighting. For women: Sewing, dress-making, millinery, cooking, laundering, housekeeping, mattress-making, basketry and nursing.

Special buildings are provided for the trades, large shops for the men grouped in one building, and in a separate building, class rooms, kitchens and laundries for the girls. In arranging the courses, four things are kept in view: First, to teach the dignity of labor; second, to teach thoroughly the trades; third, to supply the demand for trained industrial leaders; fourth, to assist the students in paying all or part of their expenses.

All the work is of a practical nature; in the machine shop the beginners are set to general work about the shop, filing, chipping, etc., until they gradually learn how to hold a hammer and are sufficiently skilled to operate the machines. In carpentry a six months' preliminary course is given in the use of tools and simple Sloyd problems, but in the majority of the trades the students acquire skill by performing the actual work, receiving instruction as problems arise rather than in any systematic order. Every student in any trade is required to learn all the different parts of his trade, but instruction is not so emphasized that a commercial product is impossible. Nearly all of the school buildings are built by student labor, at a cost only slightly above the cost, in working time, for journeyman work. All the vehicles used at the institute are built by the students and painted by them, uniforms are made in the tailoring department, harness by the harness-making students, and tinware by the tinsmiths, furniture by the cabinet-makers, iron bedsteads by the machinists, and a large part of the builders' hardware by the blacksmiths.

In the machinists' course, more than in any other, the work assumes a distinctly school or exercise character. But the machinists are required to keep all the machines on the grounds in repair, and in the machine shops a number of working engines have been constructed.

I quote the following outline of the courses in machinery, engineering and founding, from the school catalog:

"The equipment of this division and the course of study offered are designed to give students thorough training in the various branches of machinery and steam engineering work. The machine shop is equipped with the latest machine tools, driven by power from an Atlas steam engine. Lathe, planer, shaper and drill press work as well as bench work and a course in erecting is given. All repairing of the mechanical equipment of the school, including steam pumps, steam engines, wood-working machinery, printing presses, metal-working machines, etc., is done in the machine shop. About fifty different machines outside of the machine shop, including laundry machinery, agricultural machinery, dairy machinery, etc., are in daily operation, furnishing the best illustrations of the theory work of this division. In the steam engineers' course, the young men have studies from eleven different steam engines, seven steam pumps, twelve steam boilers, a complete water works system, with miles of piping, and the various water works' equipment—valves, gauges, recording apparatus, etc.

"The instructors give the students the theory and written work pertaining to the trade, and mathematical studies are so correlated as to give the students jobs from blue-print drawings and free-hand sketches.

"A foundry is also in daily operation, where the castings used by the school in repair work are made. Two cupolas are used, with blast from Sturtevant blowers—one number thirty Caullian cupola, and 17-inch cupola of the Purdue University make. Two heats are made a week, varying from five to fifteen hundred pounds of metal poured off each week."

I give below the details of the courses in machinery and founding:

MACHINERY.

First Year—Use of rules, squares and calipers. Instruction in foundry practice. Vise work in chipping, filing, scraping. Use of taps and dies. Theory of thread standards and measurements. Laying off work for drill press and shaper. Use of punches, gauges, and templates. Use of various files, gauge and cape chisels. Babbiting small boxes and treatment of babbit. Naming machinery parts and technical terms. The action of steam and the steam engine. Packing unions, glands and man-heads. Machine shop arithmetic and written work. Proper speed of machine tools on various metals. Industrial classes. Mechanical drawing.

Second Year—Drill press work with twist drills. Grinding drills, reamers and counter-borers. Use of various steels, tempering and annealing. Foundry work in moulding and cupola management. Boring bars in drill press. Valve setting on steam engines. Engine governors and valve motions. Duplex pumps, steam traps and water meters. Proper methods of piping steam machinery. Practical work with injectors, lubricators and air pump. Shaper work in slotting, grooving and beveling. Planer work in straight, oval and bevel cuts. Lathe work in turning straight and oval, and general repair work. Arithmetic in machine shop problems. Boiler management, safety valves, reduction valves, gauges and trimmings. Industrial classes. Mechanical drawing.

Third Year—Use of jigs and templates in interchangeable work. Use of micrometer and Vernier calipers. Lathe turning for shrinking fits. Use of mandrels, arbors and chucks. Erecting machines, with instruction in foundations, and use of hoists, pulley-blocks and lining machines. Five weeks as engineer of electric light plant, with three engines to adjust and manage. One given period as foreman of machine shop. Cutting worms and inside threading. The steam engine indicator, reducing mo-

tion and diagrams. Instruction in gear wheels and pinions. Work in turning, drilling, planing and shaping in tool-making. Machine shop arithmetic. Machine design. Industrial classes.

FOUNDING.

First Year—Students entering this department are first taught the names and uses of tools, how to cut and temper sand for moulding. Cleaning castings, ramming up drags, lifting and closing flasks. Students are expected to have thorough training in the foregoing steps before beginning work as moulders. Instruction is given in putting up simple moulds, the use of the clamping bar, the names and uses of the different kinds of facings used in the foundry, venting, sponging, and drawing patterns and gate cutting. Industrial classes. Mechanical drawing.

Second Year—Carrying and pouring off iron by use of hand ladles, at which time the qualities of iron are explained for the different grades of moulding. Skimming and feeding are carefully practiced. The student is given the higher branches of moulding, as in pump and engine building, stone moulding, fancy return work, core-making and core-venting, and in cupola management, lining cupola, mixing iron, making charges, tapping out and stopping in. Industrial classes. Mechanical drawing.

The management of the foundry as an ideal shop is particularly associated with every step given in the course of study.

The instruction given in the other trades is no less systematic and thorough. Every department is made to yield a commercial product. In the brick yards, for instance, the students made 2,990,000 bricks in the year 1902-1903. More than 2,000 fruit cans were made in the tin shop during the same year, and 5,000 gallons of fruit were put up in the canning department. The plumbing and steam-fitting in most of the buildings of the institute was done by the students in the plumbing department.

INDUSTRIAL TRAINING FOR GIRLS.

Plain sewing is required of all female students. The work in this course covers the first year, for all students, while a great many are required to practice the simple processes of sewing for two years. After that instruction in dress-making is given. In these courses the students do not play at sewing, but are given practical jobs, making underwear and shirts for the men, hemming linen for the school, doing plain sewing for outsiders, making the uniform dresses for the female members of the student body, or special gowns for the members of the faculty. The course in millinery is reserved for girls who are especially skilful in sewing. It is regarded as a trade course, rather than a course in household art. The instruction in cookery is of a high order and especially adapted to the home needs of the students. Cooking lessons are given to nearly 400 girls during the school year. Laundering is taught in large modern laundries, where all the school laundering is done. Here women night school students are given an opportunity to earn a part or all of their expenses.

Stress is laid upon the home training of girls at Tuskegee. A model home is provided where the young women are taught to do by doing. The course has been outlined as follows: The home: location, sanitation. Surroundings, advantages. Cleaning: when and how. Lamps, beds and bed-rooms. General weekly cleaning. Scrubbing. Care of dining-room. Table serving, linen, silver, pantry, dishes and towels. Duties and manners of hostess. Kitchen: furnishings, care. Marketing. Economy, punctuality and regularity in preparing food. The sick room: attractions, ventilation, changing patient's clothing and bedding. Feeding

and visiting the sick. Yards and outhouses: how to keep clean and how to beautify. Visiting: when, how and whom to receive. Housekeeper: personal appearance. Dress: what to wear, colors suitable. A practice house is maintained by groups of seniors where for a certain required period the economies and laws of good housekeeping learned in the earlier courses are put into execution.

At the Tuskegee Hospital a regular nurse training course is given.

By far the most important work done at Tuskegee is along agricultural lines. About 35 per cent of the Southern Negroes are tillers of the soil. A large proportion of the students at the institute come from agricultural districts. Frequently they come to escape the drudgery of the farm and seek an opening for a more eventful life through a few years at Tuskegee. But Tuskegee aims especially to equip young men for lives as successful farmers. Twenty-five hundred acres of land are owned by the institute. Of these, 900 are under cultivation. Large pastures are provided for the cattle and horses. Tuskegee breeds its own livestock and aims to produce stock of fine quality and usefulness. In the experimental farm various experiments are carried on testing the value of fertilizers for the discovery of methods of enriching and adapting the soil. The land in the Tuskegee region is not especially fertile, so that results are accomplished more often through agricultural skill than through happy natural conditions. Results secured at the experimental farm are published among the farmers of the locality, and when of general interest, through the entire South. The instructors of the department give demonstrations to farmers about, or visit farms which are not giving satisfaction and prescribe remedies. A considerable annual product is secured from the institute farms. All food-stuffs required by the school are raised by the school.

Dairying and truck gardening are taught to the women. Horticulture has recently been introduced so that florists will, before long, be trained at Tuskegee.

It is impossible to examine all the various activities of the institute with equal scrutiny. They are too numerous, even for superficial description. I have set down enough to show how important the work of the institute is along social and economic lines. Frequent criticisms are leveled against the institution, and many ungenerous charges are made against its head, but no one, however prejudiced against the Negro, denies that Mr. Washington and his associates have not failed to make a success of what they aim to do. Tuskegee *does* raise the standard of life among the Negroes whose lives it reaches, not upon artificial props supplied by a smattering education, but by hard work, hand training and moral teaching of a practical work-a-day kind, all of which not only raises the Negro's self-respect, but justifies it; not only makes him aspire to right living and economic usefulness, but prepares him for them.

HOME INDUSTRIAL SCHOOL.

ASHEVILLE, N. C.

The Asheville Home Industrial School is a seven grade boarding school maintained by the Woman's Home Mission Board of the Northern Presbyterian Church. The school was opened in 1887 with 70 boarders and 40 day scholars.

In connection with this school there is a normal and collegiate institute, and a farm school for boys. At the home school there are 115 boarders, more than that number the school cannot accommodate. The

girls come from the mountains, where they live under conditions practically identical with those endured by the Kentucky mountaineers. Any education is to them a rare opportunity; in only a few places are local schools provided, so that if they wish to secure an education they are required to leave their homes. The Asheville school seeks to emphasize the Christian home qualities. It teaches, perhaps, nothing more thoroughly than the accepted Christian tenets of right living. The girls are taught to read and write, they are taught geography, spelling, cooking and sewing, but above everything they are taught piety.

Unlike Tuskegee, the Asheville Home School assumes that a people living the hard, semi-civilized lives of the mountaineers, or the black belt negro, requires, especially, a religious basis for their activities. Asheville aims to make the women good rather than useful. Tuskegee believes that if they are useful they are pretty likely to be good.

The Asheville school is, however, a very praiseworthy institution. The fact that it limits its interest to the homes of the people it seeks to uplift does not discount its usefulness. By teaching the mountain girls how to sew and cook, how to make gentle housewives and christian mothers, these girls, coming in from rough mountain regions, are introduced to the comforts and decencies of civilized life from which they are hardly likely to depart when they return to their early homes.

I discover nothing especially noteworthy in the methods of instruction employed at the school. The cooking department prepares the food for the teachers and students. Special food is prepared for the teachers, who are served in a separate dining room by the girls of the school. The actual cooking done in the first three grades is along very simple lines but imaginary exercises in more difficult cooking are given the younger students. The teacher recites certain recipes, omitting some essential ingredient, then tells her class that the result was unsuccessful: the meat was tough, or the bread soggy. The students are then supposed to discover the causes of the results, i. e., the omission of parboiling for the meat, or insufficient yeast for the bread. The answers in such an exercise, at any rate, afford considerable entertainment both for the class and a casual visitor.

The advanced grades are given instruction in the chemistry of cooking and dietetics. Lessons are given in simple housekeeping and the construction and arrangement of inexpensive homes.

Throughout the entire course the girls are trained in domestic work, room-cleaning, bed-making, laundering and home-cooking.

HAMPTON INSTITUTE.

Hampton, Va.

The Hampton Normal and Industrial Institute was founded in the year 1868 for the education of Negroes and Indians, by General S. C. Armstrong. The school is located on an arm of Hampton Roads, near Old Point Comfort, Virginia. "The aim of the Hampton School is to train its pupils in such ways as will prepare them to be of the most service to their own people. By the education of the head, the hand, and the heart Hampton equips its graduates for lives of usefulness. It is expected that whatever a student gains at Hampton, he is to pass on to other lives. It is hoped that he will stimulate his people to better ways of living, and aid in making the community in which he lives, intelligent, self-supporting and Christian. . . . Hampton has sent out over eleven hundred graduates, of whom sixty per cent are teaching, while at least six thousand undergraduates have gone out to prove the

value of their industrial training. Over eighty per cent. of those who have taken trades are either practicing or teaching them. Eighty-seven per cent. of Hampton's returned Indians are reported as doing well." No Negro graduate of Hampton, to the knowledge of the Institute after diligent inquiry, has been convicted of a crime. Wherever Hampton graduates have gone, landholding has increased and crime has correspondingly decreased.

From small beginnings the institute has risen to an enrollment of 1,180, of this number 96 are Indians and the balance Negroes. There are 348 students in the day school, 369 in the night school, 23 post-graduates and 432 children in the Whittier practice school. The institute owns sixty buildings, which include, besides dormitories and recitation halls, a library, church, hospital, gymnasium, saw and planing mill, workshops, and a building devoted to agriculture and domestic science. The institute owns two greenhouses, forty acres of lawns, roads and flower beds, and two farms of 750 acres, equipped with stock, buildings and farming implements. The location of the school is rarely beautiful. The influence of the sea upon the character of the students can be no inconsiderable element in Hampton's work of developing strong men and women among the backward races.

Hampton is in many respects the parent of Tuskegee, not only in so far as Booker Washington and a large number of his assistants have received their training there; but in respect to the methods and purposes of the institute itself. The similarity extends down to rules governing the conduct of students. No doubt this similarity is not wholly attributable to Mr. Washington's splendid power of gathering ideas from other institutions. The exchange of ideas is surely reciprocal, for Mr. Washington has the peculiar advantage of handling his own problem, while the methods of the workers at Hampton are pretty largely those of the missionary. Hampton enjoys the composure of an institution whose administrators are not the cynosure of all eyes interested in extraordinary achievement; the air of quiet assurance contrasts interestingly with the bustle at Tuskegee. If this fact is in any way noteworthy, it is certainly not astonishing, if one takes into consideration the difference in climate at the northern and southern institutions, and the difference in temperament between the white teachers at Hampton and the colored faculty of Tuskegee. I wish, however, to make it clear that I do not believe that Tuskegee is injured by the comparison.

Without discussing the activities in the academic department of the institute I shall proceed to a consideration of the methods and scope of the training in the trades, household activities and agriculture, which activities are steadily assuming increased importance in the school curriculum.

Hampton is provided with a group of model shops where the following trades are taught: Carpentry, painting, wheelwrighting, blacksmithing, machine-work, tailoring, bricklaying, plastering, shoemaking, harness-making, steam-fitting and tin-smithing.

The advantage of entering the Trade School is that one can take up a trade by logical and systematic steps from beginning to end. Each department is free to teach fundamental principles, by the careful application of which to commercial work, and by constant drill in the use of tools, it is believed that the student has a far better chance of well-rounded training than under the apprenticeship system.

In addition to the above there is a large opportunity for experience in the various industries on the school grounds. These industries are directly under the control of the institute and are open to the Trade School students, who are expected, as a part of their respective courses, to spend in them a portion of their time. The Trade School, through the munificence of its friends, has one of the best equipments of tools and appliances to be found in the country, and tries to carry out Hamp-

ton's underlying thought of providing such an education as is a help not only to the individual, but through him to his race.

Every trade student is required to devote nine hours a day to his trade and two hours to recitation in the Night School. As it is impossible for trade students to earn money at their trades during the first part of their trade course, it is expected that those who cannot pay their board in cash will have from \$50.00 to \$100.00 accumulated from previous work in the institute, to cover their necessary expenses. During this time, however, and at the discretion of the faculty, one day each week may be allowed as a work day, which can be spent in unskilled labor outside the Trade School.

All trade students are expected to remain for practice during the summer months, if it seems advisable. In order to make it possible for trade students to earn money enough to help them complete their courses, and to give them the best experience in their trade, a certain amount of business is carried on, and this business cannot be entirely dropped during the summer. It is believed, moreover, that the summer practice often forms the best part of one's trade experience. All the students are expected to do willingly, at any time, what seems for the best interests of all concerned. Trade students are subject in every way to the general rules governing the institute. Applicants for admission to the Trade School must be not less than sixteen years of age, and able to pass the entrance examinations to the academic department, except that for the machinists' and printers' trades, entrance to the first year middle class in the Night School is required.

Each Trade School course is three years, a portion of which may be spent in some of the outside industries. The following lines are taken up: First. Actual work at the bench; 2nd. Instruction in the kinds, grades and prices of the materials used; 3rd. Mechanical or free-hand drawing, which, as far as possible, bears on each trade; 4th. Drill in competitive labor. The Academic or Night School work consists of drill in arithmetic, science, geography, history, penmanship, etc. A certificate is given to every student who satisfactorily completes the required amount of work in any of the Trade School courses, and the First Middle course in the Night School, or its equivalent. It is distinctly understood, however, as far as the trade work is concerned, that the certificate will be given for attainment in skill, rather than for length of service.

COURSE OF INSTRUCTION.

Each carpentry student has a bench containing a very complete kit of tools, the use and care of which he is carefully taught by exercises in planing, nailing, boring, sawing, glueing, making joints, etc. When a certain proficiency is reached, a house or barn is erected either inside or outside the Trade School and each boy has an opportunity to apply what he has learned in actual house construction by such exercises as:—Laying off foundations, including running lines, setting batters, leveling and squaring. Laying off, framing, and putting into place the framework of a house; as sills, studding, floor joints, plates and rafters, including hip, valley, and jack rafters. Closing in and exterior work; as sheathing, shingling, weather boarding, putting on cornice, making and setting door and window frames, scroll and ornamental work, porch and piazza work, and step building. Interior work; as laying floor, casing openings, making and hanging sashes, blinds, and doors, wainscoting, mantel work, stair work, including newels, rails, and balusters; laying out and constructing stairway. Miscellaneous work; as fence building, truss construction, etc.

All exercises are worked from drawings. Lectures with incidental study will be given on topics connected with the trade; as foundations, chimneys, trusses, moldings, hardware, painting and glazing, wood and

other materials. An excellent opportunity is afforded for studying the manufacture of lumber from the log to the finish, as the institute owns and operates a large saw and planing mill with dry kilns and the various machines for the manufacture of lumber.

The House Building course is arranged to combine a knowledge of carpentry, bricklaying, plastering, painting, metal roofing, and gutter work; and the course of instruction is abridged from the respective departments in which the student is employed. This department is designed for young men who may wish to settle in small communities where a knowledge of several different trades will be of benefit, or for those who wish to become contractors and who desire a general knowledge of the whole building trade.

The Mechanical Drawing course is given as part of the training of all trade students. Tailors, shoemakers, harness-makers, and painters have free-hand drawing instead. The drawing is arranged with a view to giving the student a general knowledge of working drawings, preparing him to interpret intelligently drawings placed before him, and to cultivate his ability to make working drafts, plans, elevations, and sections of tools, buildings, machines, wagons, and other work in the line of his trade, and to build according to the same.

The course comprises:—

1. a. The study of projection-plans, elevations, and sections.
b. Practice in free-hand sketching (projection).
2. Spacing and drawing straight and curved lines.
3. Making joints.
 - a. Between straight lines.
 - b. Between straight lines and curves.
 - c. Between curved lines.
4. Making block letters.
5. Geometrical problems.
6. Drawing plans, elevations, and sections.
 - a. From the object itself.
 - b. From other drawings.
 - c. From memory or original design.
7. Getting out bill of material and estimating cost of some pieces of work actually done.
8. Designing and estimating.

At Hampton, more than at Tuskegee, emphasis is laid upon *instruction* in the trades. There has not been the same necessity for employing all of the trade students in the work of providing buildings and equipment at little cost. There is, however, abundant opportunity offered the students for commercial work and speed tests. Wheelwright, blacksmith, tin, tailoring, shoe, harness, paint, machine and carpenter shops are conducted as commercial enterprises. A steam-fitting department, a press, the farms, the sewing and housekeeping departments are also actively engaged in productive work. These industries are largely carried on by the advanced students in the Trade School, but in some cases they afford employment to capable young men who are working for credit to enter the Day or Trade Schools. Wages to the amount of \$10,176.81 were paid during the year 1903-04.

The following is a partial list of the products of the Trade School:— The blacksmith and wheelwright departments have made 660 trucks for 38 railroad and steamship companies, have built 19 wagons and carts, and repaired 39 vehicles of various kinds. They have also made the iron for 1,200 plows, which were shipped to South Africa. The machine shop worked up over 50,000 pounds of cast iron, made 6,000 wheel axles for plows, made axles, wheels, and boxes for 20 lumber cars, did repair work on the Corliss engine, power punch and shear, mortising machine, lathes, laundry machinery, pumps, various wood-working

machines, tools, etc. The harness department has sold 70 harnesses, ranging in price from \$8.00 to \$90.00 each. The shoe shop has made 167 pairs of shoes and repaired 1,204 pairs. The tailor shop has made 337 uniform suits and 234 pairs of trousers. The carpenter shop, in addition to important work in construction of buildings, has made 30,000 typewriter bases, 32 chicken brooders besides picture frames, book-cases, chairs, chests, boxes, and stools. The tin shop has put in 160 squares of tin roofing and made 725 pieces of tin ware. The bricklaying department has laid 178,000 bricks and 800 square yards of granolithic walks. This commercial work has not only given the students valuable training but has enabled them to do much towards their self-support. Manual training in joinery, wood-turning, sheet metal, and mechanical drawing has been given to 121 boys not taking trades, and has been of a more practical character than heretofore.

The Trade School students were distributed as follows in the year 1903-04:—

Carpentry	71
Blacksmithing	34
Wheelwrighting	17
Shoemaking	5
Harnessmaking	1
Bricklaying	16
Painting	15
Upholstery	4
Tailoring	41
Steam fitting	26
Tinsmithing	1

231

The largest number of students have taken up carpentry. The foreman reports that there is not a single boy taking this trade who can be called trifling. The plan of correlating carpentry with bricklaying, painting, and tinsmithing, so as to give the students an all-around mechanical training such as is needed in the country places of the South, has worked most satisfactorily. The blacksmithing and wheelwrighting departments are among the most popular ones. There is no question as to the moral and mental results obtained from the careful work required in these trades. It seems probable that another year it will be wise to make still stricter academic requirements for admission to these trades. The grade of work done in the bricklaying department is in advance of anything that the school has hitherto accomplished. A fine new dwelling house erected at Shellbanks was built almost entirely by students of this department. A new students' kitchen, including the brick ovens and chimney, fireproof construction, and granolithic floors, was their work.

The instructors in the Trade School are all practical workmen. Some are graduates of Hampton, but every man who teaches a trade has had practical experience in earning his living as a workman. The discipline and spirit of the shops are not unlike those of a well ordered manufacturing establishment.

The students conduct themselves in a workman-like fashion. After the first year in the trade the work is for wages. The institute is careful that it pays wages for value received. The instructors not only teach but act as foremen in the shops. A number of them work along with the students, performing the more difficult operations. If the department is large enough an assistant foreman or instructor constantly works with the students, setting a standard of workmanship, speed and diligence. The facts concerning the school which I quoted above will indicate clearly enough that Hampton makes no play at teaching men

how to acquire skill and reliability as workmen. My observation of the shops confirms the claims the institute makes for this department. It was a fine thing to see a lot of fellows working with interest in their work, with the care and business-like bearing of workmen, in well equipped and superior shops, and to know that while they worked they not only produced wealth and earned wages, but grew in mind and body.

In addition to the girls in the Whittier Practical School there are 294 Negro girls at Hampton and 52 Indian girls. All of these girls receive instruction in cooking, housekeeping and sewing. They are taught in a thorough manner by trained teachers who have the very best modern equipment at their disposal. A number of the girls are trained for positions as matrons, housekeepers, or cooks. It is a common thing for a woman student to secure employment as a cook or housemaid in the North for the summer. Girls may earn wages in sewing, laundering, housekeeping and waiting on table. All students, girls as well as boys, are required to take work in agriculture during the entire course in the Academic Department. Experiments are carried on in the field, 20 acres being set aside as a practical farm. The topics taken up include Plant Life, Soils, Plants, Soil Water, Farm Drainage, Irrigation, Manure and Manuring, Commercial Fertilizers, Tillage and Rotation of Crops, Study of Special Crops, Plant Propagation, Transplanting, Cover Crops, Pruning, Insects, etc. The instruction is directed towards supplying the students with knowledge of the requirements for successful farming in the South and West, in the interests of which sections the school was established.

Besides the instruction in agriculture offered by the Academic Department there is a special course in agriculture for persons purposing making farming a vocation. The scope of the work of the Agriculture Department at Hampton will be interestingly indicated by the following extracts from the 36th Annual Report of the Principal of the institute: "So long as it is true that more than eighty per cent. of the Negro race in the South and nearly all of the Indians are dependent upon the soil for their living, it is clear that Hampton should make agriculture its central study. This the school has endeavored to do. Beginning in the Whittier kindergarten the children are given plots of land and are taught how to raise crops of kale, onions, lettuce and radishes, which they are allowed to take to their homes. This Whittier garden is said to be the largest in this country devoted to school purposes. Certainly no other school of the size of Hampton devotes more time and money to the study of agriculture. While the young men show interest, the young women are enthusiastic. A number of the latter who returned last fall reported that they had been successful in the raising of poultry during the summer vacation.


"Considerable progress has been made during the past year in introducing agriculture into the common schools. The question of caring for the gardens during the summer months is a serious one. This has been successfully met by asking volunteers to care for the garden plots during the vacation. Each year the number of these volunteers has increased and the gardens have been better cared for. As a result of the introduction of agriculture into the Whittier School, two hundred gardens have been started by the children at their own homes. It is clear that if there is to be any interest in agriculture among grown people instruction must be given in the primary schools. Hampton is making every effort to bring this about. At the last session of the summer school, every teacher in attendance was required to take either agriculture or nature study. Several classes made gardens and raised crops during the six weeks' institute. The Nature Study Bureau continues to assist in this work by issuing leaflets which are in daily use in many Southern schools. In order to make the study of agriculture and nature study

effective in the schools, however, it should be made compulsory and should have competent supervision. This cannot be done, of course, without the co-operation of school officials. In our immediate vicinity, where some of the colored schools are under the care of Hampton Institute, an effort is being made to establish and supervise this work."

Instruction in agriculture is given by means of text books, lectures, and practice work; class room work is illustrated by means of specimens, models, charts, photographs, etc. As far as possible each student is required to put in practice the principles taught in the class room. Students in agriculture are required to put a certain number of hours each week into recitation, study, drawing, and practice work. Practice is an important feature in the work, and for pure practice the student receives no wages. After meeting the requirements as to recitation, drawing, practice, etc., the student is given an opportunity to do necessary work in the department, and is paid therefor according to his ability and the actual time spent in doing the work, being thus enabled to earn something toward paying board and incidental expenses. As in the other departments no charge is made for tuition.

Twenty acres of land have been devoted especially to practice work. Ten acres have been planted with small orchard fruits, and the remainder is used for experiment and illustration in the growing of farm, truck, and garden crops. In the Domestic Science building the department of agriculture has six large rooms, a museum and lecture room, a laboratory for chemistry and physics, a laboratory for botany, horticulture, and entomology, a farm laboratory, a dairy, and a farm-engineering room. The department has two greenhouses.

Hampton is meeting the needs of its students in a sane, efficient, and highly skilful manner. It understands the necessity of educating men and women for lives as effective manual laborers no less thoroughly and carefully than we educate men and women for the cultural activities. It is a strong step in the right direction; it will not be long, let us hope, before every boy and girl, whether a member of the backward races or not, is equally well prepared for the work that must be done and he is destined to perform.



PART II.
NORTHERN INDUSTRIAL AND TRADE SCHOOLS,
AND TECHNICAL INSTITUTES.

	PAGE
Introduction - - - - -	28
Letter to Mr. John G. Wood - - - - -	29
Report on Williamson Trade School, Williamson, Pa. - -	30
Report on Drexel Institute of Art, Science and Industry, Philadelphia, Pa. - - - - -	32
Report on Franklin Institute, Philadelphia, Pa. - - -	34
Report on Girard College, Philadelphia, Pa. - - -	35
Report on New York Trade School, New York, N. Y. - -	37
Report on The Baron De Hirsch Trade School, New York, N. Y.	40
Report on the Manhattan Trade School, New York, N. Y. - -	41
Report on Pratt Institute, Brooklyn, N. Y. - - -	43
Report on North Bennet Street Industrial School, Boston, Mass. -	46
Report on The Lowell Textile School, Lowell, Mass. - -	46

INTRODUCTION.

The Northern trade and industrial schools are devised to supplement the work of the public grammar schools, and to provide a substitute for the almost obsolete apprenticeship systems. They aim to furnish an opportunity for workingmen to supplement their common school education and workshop experience with study in evening classes along the lines of their practical interests, or to train young men and women for skilled work in the trades and industries during the day.

They differ from the southern institutions in that they are not concerned with the development of an entire race or class of backward people, and because they are wholly intended to open up opportunities of advancement, for especially earnest young men and women, in industrial pursuits. In several of the larger institutes there is some departure from the entirely practical scheme of education which characterizes the typical trade school. In these institutes means of recreation and general culture are frequently provided, which only indirectly result in the higher efficiency of those who take advantage of them.

The northern schools have been organized because of a demand on the part of workers and employers for some more scientific and thorough method of trade instruction than it is possible to furnish in the highly specialized modern factory, or in the building trades, where the pressure of competition does not permit employers to concern themselves to any appreciable extent with the development of new workers.

As a type of the highest development of the pure trade school, I wish to draw particular attention to the work of the New York Trade School in New York City. On the other hand, the Drexel Institute in Philadelphia is representative of those institutions which, while they teach their pupils how to do things, are also concerned with their general cultivation and enlightenment.

Chicago, Ill., July 19, 1904.

Mr. John G. Wood,
General Superintendent McCormick Works,
International Harvester Co.

Dear Sir:—I hand you herewith my reports on the several Trade Schools and institutions for industrial training north of Mason and Dixon's line, which I visited during my investigation. In addition to the reports on the schools, I hand you a recent article on Factory Education, published in The Commons, several notes on Apprenticeship Systems and a brief description of the Philadelphia Commercial Museums.

Respectfully submitted,

901 W. 22nd St.

HENRY BRUÈRE.

PART II.

WILLIAMSON TRADE SCHOOL.

Williamson, Pa.

About ten years ago a Philadelphia merchant, Isaiah V. Williamson, bequeathed one million dollars to found a free school for boys where they might be prepared to earn their living in the trades.

The purpose of the school is to take intelligent, moral and healthy boys, in limited financial circumstances, who are between 16 and 18 years of age and to give them comprehensive instructional three year courses in the basic principles and practices of the trades to which they are assigned, and to graduate them in such condition that by a subsequent short experience in actual commercial work they may become skilled journeymen.

The mechanical instruction is supplemented by thorough teaching in such school branches as are required to develop the pupils into men of good general information, capable of intelligently expanding, with growing experience, into superior mechanics.

The course in the principles of mechanical drawing is one of the valuable educational features of the school, and while the purpose is to make it supplementary to the trade work and not to teach it as a vocation, some of the first graduates were so well grounded in it that they have made excellent records as draughtsmen since leaving the school.

Special attention is given to the moral training of the pupils so that they may be reliable men as well as competent mechanics. The trustees deem it to be quite as essential to have the pupils become good men as well as good mechanics. Although the school is non-sectarian each pupil, immediately after admission, is required to designate the religious denomination of his choice, and thereafter attend its services regularly at its place of worship in the neighborhood. The domestic life of the school conforms as far as possible to good family government. To that end the scholars are divided into families of twenty-four, each having its matron and its own distinct home or cottage, cared for by its occupants.

Other things being equal preference in admission is made (1) to boys born in the city of Philadelphia, (2) to boys born in Bucks Co., Pa., (3) to boys born in Montgomery and Delaware Cos., Pa., (4) to boys born elsewhere in Pennsylvania, (5) to boys born in New Jersey, (6) to boys born in the United States. Only natives of the United States are eligible for admission. These restrictions on admission are made because while the capacity of the school is limited to about 200 pupils, the yearly application for admission exceeds that number. Candidates are required to pass scholastic, moral, and physical examinations, and only boys are admitted who intend to follow for a livelihood the trades taught them at the school. The entrance examinations are rigorous, and on the scholastic side include reading, writing, spelling, arithmetic as far as fractions, geography, United States history, composition and language. After a moderate preliminary trial, all who prove satisfactory are bound as indentured apprentices to the trustees for the term of three years from their entrance, with the provision that the indenture may be canceled at any time by the trustees for the school on account

of the scholar's incompetency or bad conduct, or if for any other reasons the trustees think him undesirable for continued support and education. By the indenture these scholars are obligated to conform to all regulations and restrictions prescribed by the trustees or their representatives, and all right or claim to control them during the period they remain in the school is vested in the trustees.

The trades taught are as follows, the assignment of the boys to any trade being made by the trustees: Carpentering, Bricklaying including range, furnace and boiler setting, Pattern-making, Machine trade in all its usual details, Steam and Electrical Engineering, Steam-fitting, etc. Each scholar takes but one of the trades named and his instruction in mechanical and free-hand drawing tends in the general direction of his particular trade. The courses are systematic and thorough, and based on instructional methods. No money has been spared in the provision of equipment for instruction in the trades and the school stands pre-eminently for the exercise method. In the wood-working department over \$900.00 was spent last year in providing material for an exercise in interior finishing. After the work had been thoroughly completed by the advanced students, the beginners were set to work tearing it down, with the result that very little of the material could be used for any further purpose. Only rarely does the school permit any of its students to be employed in the construction work about the premises. This is in marked contrast to the practice at Tuskegee and in a lesser degree at Hampton. In the bricklaying department costly arches, chimneys, and fireplaces are constructed involving days of labor, which are subsequently razed. While the machinists repair and fashion tools for their own use, they never manufacture pieces for outside concerns. Dies, jigs, and castings of one sort or another are carefully made and finished only to be thrown in the scrap pile after completion. But on the other hand, speed exercises are given from time to time in which accuracy as well as celerity is insisted upon. Naturally the boys take great pleasure and pride in these exercises, and their occurrence is a special event in their lives.

The superintendent of the school is a strong advocate of the exercise method of trade instruction in contrast to instruction by productive work. He does not believe that any good results from the commercialization of trade school work, because it inevitably interferes with a systematic course of instruction, for which end the school primarily exists. Of course this plan of school requires substantial endowment, but if trades are to be taught in a school there does not seem to be any reason why they should be less thoroughly taught than the academic branches.

The school term continues the entire year but those pupils who merit it are given about four weeks' vacation in summer and a few days at Easter, Fourth of July, and Christmas. The school and shops are in session eight hours daily on five days of the week and three hours on Saturday, each scholar spending about four hours in the class rooms and four in the shops daily the first year, the proportion spent in the shop gradually increasing towards the close of the apprenticeship.

The branches taught in the academic department are reading, writing, arithmetic, algebra, geometry, trigonometry, physical and political geography, history, physical science, English literature, physiology and hygiene, civil government, chemistry, elementary vocal music, theory of the steam engine, strength of materials, and building construction.

The Williamson Trade School is par excellence a school for training skilled workmen. It represents, perhaps, the most advanced type of trade school, the school where the proficiency of the workman is the first consideration. Influenced by the high educational standards of the North, strengthened by its endowment and the explicit purpose of its founder, it carefully selects the boys whom it trains with the natural result that its graduates, in almost every instance, become successful

men in the trades taught them at the school. Of all the boys whom this school has educated only one has failed completely, the rest have left the school for good positions. There is a constant demand upon the school for workmen on the part of employers, and the records of the graduates in commercial shops has been in every instance satisfactory to the school.

DREXEL INSTITUTE
OF
ART, SCIENCE AND INDUSTRY.

Philadelphia, Pa.

Drexel Institute was founded 1891 by Anthony J. Drexel for the promotion of education in Art, Science, and Industry. The chief object of the institute is the extension and improvement of industrial education as a means of opening better and wider avenues of employment for young men and women. At the same time the academic departments provide for the general development and liberal training of the mind and character of the students, and in the more special and technical courses the same end is kept in view, so far as the necessary limitations of the instruction permit. The plan of organization provides liberal means of culture for the masses by the establishment of evening classes in all departments of the institute, by free public lectures and concerts during the winter months, and through the library, museum and picture gallery which are open free to the public throughout the year.

The institute is situated in the heart of Philadelphia and is splendidly housed in a building costing upwards of one million dollars. The Technical School has attained a wide reputation for its excellence and is ranked with the best of the older institutions of the country. It would be as difficult a task to describe in detail the methods and results of the institute's work as it would be to perform a similar task in regard to the work of Harvard or Cornell University. The conspicuous feature of the institute, however, is the fact that while its endowment is large, its equipment of the first quality, and its reputation as an educational institution of the first rank, it actually adheres to the purpose for which it was founded, namely, the education of the common people, while other institutions similarly founded and equally well supplied with means have developed into institutions for the education of the well-to-do. A statement of the variety of courses offered at the institute will indicate the range and breadth of the service which it renders the community. Instruction is offered in:

1. Fine and Applied Art.
 - a. School of Drawing, Painting and Modeling.
 - b. School of Illustration.
 - c. School of Design and Decoration.
 - d. School of Architecture.
2. School of Science and Technology: Comprising instruction in general engineering subjects.
3. Department of Commerce and Finance.
 - a. School of Commerce and Accounts.
 - b. Commercial course for teachers.
 - c. Office courses: Secretary, Bookkeeping and Stenography.
4. Department of Domestic Science.
 - a. Courses in Cookery and Household Economics.
 - b. Normal Course in Domestic Science.

5. Department of Domestic Arts.
 - a. Courses in Dressmaking.
 - b. Courses in Millinery.
 - c. Normal Courses in Domestic Arts.
6. Department of Junior Domestic Sciences and Arts: For younger students.
7. The Library School.
8. Special Courses in English Language and Literature.
9. Department of Physical Training.
10. Department of Evening Courses.
11. Department of Free Lectures and Concerts.
12. Department of Evening Classes in Choral Music.
13. The Library and Reading Room.
14. The Museum and Picture Gallery.

Note to Department 10: In this department instruction is given in all branches provided for in the Day School, except that courses are modified to meet the requirements of abbreviated time and special needs of the Night School classes, which are composed almost wholly of clerks and wage earners. The tuition charged in the Night School ranges from \$3.00 to \$10.00 per class.

While each department is organized with reference to its special objects and courses of instruction, it sustains important relations to the courses of the other departments, and the various lines of work are carried on in so broad a spirit as to give a certain unity of purpose to the scope and end of the institution as a whole. Both in the Night and Day School special courses are given in shop work in addition to the general work provided for by the School of Mechanic Arts, in wood-working, exercises are given in joinery, turning, and pattern-making, in iron work, exercises in chipping, filing, in forging and welding, forging and tempering of machine tools and ornamental work from designs. A course is given in machine construction in which the use of machine tools is taught, and practical work afforded in the building of machinery.

The shops are equipped with every appliance necessary for instruction. The course in Mechanical Drawing is intended to meet the needs of persons to whom a knowledge of mechanical drawing is necessary, and whose daily employment makes it possible for them to attend only in the evening.

The full course of instruction in Mechanical Drawing in the Night School is divided into three years as follows:

First Year: Use of mathematical instruments, orthographic projections, intersections, and development of surfaces.

Second Year: The application of the development of surfaces to machine construction, and detailed working drawings of machinery.

Third Year: Practical working drawings of machine construction. The Commercial Museum.

A permanent Commercial Museum has been established at the institute, and a large collection of raw manufactured products has already been secured. The collection represents quite fully the following industrial products: Flour, wool, petroleum, teas and coffees, sugar, cotton, copper, iron and steel, glass, tobacco, leather, rubber, paper, wood, carpet, linen, spices, aluminum, building stone, brick and terra cotta. The Museum is designed for students in the Academic Department who are looking forward to devoting their lives to trade, shipping, or manufacturing, and they are thus given an opportunity of making a special study, both from a geographic and an economic standpoint, of the particular industry in which they are interested.

Before closing I wish to refer especially to the success of the work done by the institute in connection with the Department of Free Public

Lectures and Concerts. During the past year from November to April over 30,000 persons took advantage of the opportunities afforded them by this department for entertainment and pleasant instruction. Among the recent lecturers I find the names of Mr. F. Hopkinson Smith, Mr. Charles F. Warren of the United States Department of Labor, Mr. H. E. Krehbiel, the distinguished New York musical critic, Mr. Sidney Lee of London, and Professor William Libbey of Princeton. The concerts include organ, pianoforte, violin, vocal recitals, and a series of oratorios and cantatas.

FRANKLIN INSTITUTE.

Philadelphia, Pa.

Franklin Institute was founded and incorporated March 30, 1824, for the purpose of promoting and encouraging manufacturing and mechanic and useful arts. It was the first institution of its class to be established in the United States. The scheme of its organization embodied many of the features of the Mechanic's Institutes which were so widely organized in England during the first quarter of the 19th century. But its purposes differed from those of the Mechanic's Institutes in that its work was not intended wholly for the instruction of artisans. It was, on the other hand, designed as a common meeting place for artisans, manufacturers, inventors, and men learned along scientific lines, where by the interchange of views and co-operation along certain definite activities, both the educated and practical type of man might secure helpful suggestions. The institute has for many years, by means of a Committee of Experts, conducted a clearing house where inventors may send their inventions and receive suggestions and advice of a thoroughly reliable character regarding the value of their ideas. An important scientific library has gradually been developed by the Institute which is open to members, special members, and, for certain purposes, to the general public. The library has been made the deposit of the government publications for the Congressional district in which it is located. It receives in addition to these, the publications of the local governmental bodies and the reports of scientific associations in America and abroad. The library is resorted to by lawyers and their clients who desire to investigate subjects relative to patents for which they may be applying. Within the institute there are scientific sections which are composed of its members, who meet once a month for lectures and discussion on the subjects of their special interest. The institute contributes to the advancement of scientific knowledge among the people generally by offering lectures from time to time on the latest developments in their branches by scientists of conspicuous standing. In the past the institute has organized and conducted exhibits of machinery, of the commercial product of certain localities, and in one instance, of the United States as a whole. On one occasion the institute held a novelties exhibit in which the latest developments along manufacturing lines were presented to the public. From time to time the institute has conducted special investigations of general scientific interest. In the year 1878, for instance, a special committee of the institute investigated the efficiency of the dynamo electrical machine for arc lighting, in 1884 the institute supplemented its earlier work in this field by a more elaborate report on the same subject and on "The Life, Duration, and Efficiency of Incandescent Electric Plants," in connection with the International Electrical Exhibition held under its patronage that year.

In 1875 the councils of the city of Philadelphia appropriated the sum of \$1,000.00 for the expenses of an expert commission to be nominated by Franklin Institute, and, with the approval of the mayor, to act in conjunction with the chief engineer of the water department, to which commission was referred the subject of the future water supply of the city of Philadelphia.

The institute conducts a drawing school in which an opportunity is furnished mechanics, apprentices, and students in industrial pursuits to spend two evenings a week learning the theory, principles, and best modern practice of drawing. The instruction is entirely individual, depending upon the capacity of each pupil. Thousands have attended its classes and hundreds have graduated to fill better positions in consequence.

The full course comprises four terms, at the end of which certificates are awarded to such students as have shown sufficient attention, industry, and progress. In order to enable more efficient and rapid progress to be made the director of the school has prepared text books on mechanical drawing with plates.

There are two terms in the year of fifteen weeks each and the tuition charged is \$5.00 per term. The institute maintains an Evening School in Machine Design in which Mathematics, Mechanics, Strength of Materials, and Machine Design are taught. The subjects offered form a complete course in constructive engineering, applied to the design of machinery, which is planned to meet the needs of those who wish to qualify for responsible positions in the drafting room or in the shop. This course presents an opportunity to obtain, at nominal cost and no interruption of business pursuits, technical training in branches usually monopolized by the modern college-bred mechanic. The work is carried on along lines similar to those employed in the best technical schools.

The entire course extends throughout four years, on the completion of which a certificate of study is awarded. The institute conducts in addition to the above activities, a Night School of Naval Architecture which embraces courses of instruction in theoretical naval architecture and ship design and construction.

The membership of the institute is open to men and women, without regard to distinction of race, nativity, or religion, the only requirements for admission being good character and friendly interest in its work. The artisan and the professor meet within its walls upon an equal footing, with a common interest to contribute to the common stock of knowledge, or to draw from that stock serviceable instruction. It is to this meeting of theorists with actual workers, this blending of science with practice, which is so pre-eminently exemplified by the life of Franklin, that much of the usefulness of the institute is justly ascribed. The roll of membership includes over two thousand names and with the exception of a small endowment, the work of the institute is carried on with money derived from membership fees.

GIRARD COLLEGE.

Philadelphia, Pa.

Girard College is a heavily endowed private institution for the practical education of boys who are without parents and the necessary means of securing a similar utilitarian education. The school was founded in the 18th century before the organization of the public grade schools. Although any boy can now secure an education in the public schools if he has a home provided for him by his parents or friends, nowhere else

can the homeless boy secure such practical training, and at the same time such agreeable home associations.

The school has a membership of 1,100 boys who rank in age from six to sixteen years. A portion of the time of each of these boys is spent in the shops and laboratories for mechanical instruction. A certain number are provided with special work in certain trades which is designed to prepare them for commercial service as journeymen. But from the point of view of industrial education the interesting feature of Girard College is the breadth and thoroughness of the work given the boys in manual training. The several shops, blacksmith, carpentry, pattern-making, etc., and the laboratories of electrical mechanics, plumbing, gas and steam fitting, etc., are all very carefully equipped and intelligently designed for giving the boy who enters them a definite, practical knowledge of the principles of the trade he studies, and at the same time to develop in him a measure of efficiency in the actual operations in which principles are applied in making useful articles.

The object of the work is to prepare the boys to earn their living immediately upon their discharge from the school. Except for the special classes in trade subjects no effort is made to give a boy peculiar skill in any particular trade, but the aim is rather to ground him thoroughly in the habits, elementary practices, and fundamental principles of the several trades. The result is that boys who leave the school are able in a short time to earn good wages in any trade which they may have chosen to enter.

From nine to fifteen hours per term are spent by each boy in the laboratory of electrical mechanics. The laboratory is a large room equipped with vise benches, hand lathes, drill presses, a five horse power Multi-Polar Westinghouse 220 Volt Direct Current motor, one Bi-Polar Edison 220 volt motor 1.5 kilowatt, two 110 volt Edison direct current bi-polar dynamos 1.5 kilowatt, a working model of an electric railway showing all details and containing about 150,000 pieces, a wiring cabinet, and a full supply of batteries and special small tools. The laboratory is very systematically arranged and presents itself immediately as a museum of electrical invention. A practical electrician is the instructor in charge and the work is, therefore, primarily mechanical. Theoretical instruction, however, is given from time to time to enable the pupil to perform construction work intelligently. All construction work is required to be done in a thoroughly workmanlike manner, the teacher lectures and demonstrates with tools in hand and is followed by the pupils in the same exercise.

The first year the course of instruction covers, merely, the splicing and connecting of wires for electrical transmission. Exercises are given in soldering, and tapping joint. In the second term of the first year instruction is given in the making of electrical bells. The differences between an electrical and a mechanical bell are shown and a blackboard drawing of the theoretical arrangement of an electrical bell with its wiring, battery and push button, is made by the pupils. Instruction is given in the various names of the details of the bell, and the materials of which it is constructed. The pupils are taught the various processes employed in the preparation of the cast iron bell frame, including instruction in the use of the compass, the operation of the drill press, filing, and finishing.

In the second year the bell is further continued, the pupil performing all operations in its construction, including lathe work, the use of the cutting off tool, round point and flat tools, calipers, dies, the use of the mandrel for holding objects in facing, and the use of the graver. Each part which the pupil prepares is carefully explained to him and its origin and evolution demonstrated. Finally the electric bell is assembled, the spool prepared for electro-magnets, and the mechanical details of the instrument completed, the electro-magnets are wound and

replaced, and the bell is tested. If any parts are defective the pupil is required to re-make them.

While the description of the work in electric bell construction is typical in its method, of the work in the entire school, it will be interesting to investigate the work required of the boys in the forge or blacksmith shop. When the boys first enter the blacksmith shop the instructor assembles them around an anvil and describes to them the uses of the anvil and the indispensable tools of all blacksmiths. A piece of lead is then drawn out by the instructor, and each step carefully explained and the proper method of standing at an anvil and of keeping a piece square are demonstrated. Following this the boys themselves draw out a piece of lead to the satisfaction of the instructor, then shape the lead into a hook, which provides them with an exercise in pointing, rounding, and bending. After this a lesson is given in building and taking care of a fire. The different parts of a forge, the air blast and the exhaust, are shown and their uses explained. The various uses of coal and coke and the use of the three fire irons are made clear to the pupil. The fire is then built and lighted, and a ring made of iron is heated, straightened, and drawn out square, the same size as the piece of lead drawn out previously. After this the pupil is shown how to heat a piece of iron, and the effects of working cold and burnt iron. In the second term of the first year the pupil is given further exercises in shaping, tapering, and making eyes in addition to instruction in bending. Finally instruction is given in the various methods of welding, riveting and punching.

During the third year the method of working steel and the differences between it and iron are taught. As a preliminary step to the actual working of the steel, the students are assembled in the lecture room, in which an anvil and portable forge are located, and a short history of iron and the conversion of iron into steel is given. The reduction and the commercial uses of iron and steel are explained, and the various kinds of iron ore and their chemical composition, the making of pig iron by smelting, the making of wrought iron, including refining, puddling, shingling, by squeezers or steam hammers, and rolling are illustrated by photographs or blackboard drawings. After this course the pupils are given exercises in ornamental iron work. In this way the eyes and hands of the pupil are trained in forming spiral or circular curves, while practical work in original designing is also afforded them.

Throughout the entire school emphasis is placed upon the quality of the work as well as upon the educational value of the exercise. The shops and machines are kept in excellent condition; the students are taught the value of the various tools and the necessity for their careful use, with the result that while instruction in mechanical subjects is of such a nature that it serves an important educational function, it, at the same time, develops the boy into a careful, thinking, and intelligent workman, who with a few years' added experience in commercial life, has every chance of a successful and useful career as a mechanic.

THE NEW YORK TRADE SCHOOL.

New York, N. Y.

The New York Trade School was founded in 1881 by Col. Richard Tylden Auchmuty, the founder of the "Auchmuty System" of trade instruction. Under this system a course of instruction is arranged by which both the practical and theoretical branches of a trade are taught, so that, not only is manual skill quickly acquired, but the scientific prin-

ciples which underlie the work are also learned. This system has produced remarkable results and attracted much attention in this country and abroad. It is believed that in the training of young men for handicrafts the combination of the trade school and the workshop is best suited to modern conditions; the trade school, to give the young man a knowledge of how to use his tools, how to do the work, and the theory of the trade; the workshop, to give the young man experience, facility, and speed of execution. For each trade taught at the school a course of instruction is prepared which outlines in detail the work a student is required to go through, and the order in which the work should be performed. At first, the student is put on work that is simple, but as skilled workmanlike use of the tools is acquired, he is advanced to work that is more difficult and complicated, until he is made familiar with the various branches of his trade. The work given the student is thoroughly practical, and of the nature of work met with in actual practice at the trade.

The scientific instruction imparts knowledge of the trade that is of the highest value, and is given by means of carefully prepared lectures and manuals, diagrams and experiments.

The instructors are mechanics of high skill and long experience as workmen, and each student receives individual care and attention. The instructors are constantly with the students making careful explanation of every step, and teaching them how to hold and use their tools, and how each piece of work should be done.

The school offers both day and evening classes; the day classes, being open to beginners as well as those who are working in the trades, make it possible for young men, who reside in distant localities, to obtain the advantages of the school. The continuous application, which the hours of the day classes afford, enables the student to complete in one term of four months, work which covers three terms in the evening classes. The amount of time that can be devoted to study by young men who have to work during the day is naturally limited, but even then rapid progress can be made in the night classes by those who are regular in attendance.

At the end of each term examinations are held in both day and evening classes. If the required standard in workmanship, theoretical knowledge, attendance and general proficiency is attained, and the full course has been completed, the student is graduated and given the certificate of the school.

Committees of representatives of the various Master Workmen's Associations visit the school regularly during the term, and pass upon the work of the students in their several trades. These committees serve for no compensation, other than the reward they derive from the school in so far as it succeeds in raising the standard of their trades and the welfare of the young workmen. The visits of these committees result in many valuable suggestions that may tend to increase the efficiency of instruction, and better qualify the young men for their trade.

The school is located on First Avenue, 67th and 68th streets, on the east side of New York City. The buildings are arranged with a view to securing large floor area, ample light, and good ventilation. The shops are steam heated and lighted throughout by electricity. The school provides a library which contains a collection of the best class of literature and technical works, which books the members of the school are privileged to take home. Trade and technical papers are kept on file for the use of the students.

The students number over 600, and while the Night School students come from New York or its immediate vicinity, the students of the Day School are drawn not only from nearly every state in the Union but from other American countries as well. The tuition ranges from \$40.00 for a course in the day classes to \$6 a term in the night classes.

In addition to the regular work of the school, courses of lectures are arranged for the benefit of journeymen, not members of the regular classes. These lectures aim to provide practical information that will be of value to the journeyman in his daily work. The usual charge for a season ticket for one course is \$1.00.

The special characteristic of the New York Trade School is that the courses are reduced in length and quantity of detail to the least possible amount necessary for thorough instruction in a trade. Here again, the school aims, in the manner of the Williamson Trade School, to give to its members such instruction, only, as they will require in their life work. Unlike the Southern industrial school, it does not concern itself in any marked degree with the general uplift and education of its students. It is designed, primarily, to provide a substitute for, and at the same time an improvement upon, the apprenticeship system.

A general idea of the methods of instruction may be obtained from a perusal of the published outline of the course of instruction in pattern making for the evening class: The term opens on October 12, 1903, and terminates on April 6, 1904. Instruction is given on Monday, Wednesday and Friday evenings, from 7 to 9:30 o'clock. This class is reserved for young men between 17 and 22 years of age.

An attendance of three consecutive terms of six months each is necessary to qualify for a certificate. The tuition fee for the first term is sixteen dollars, and for the second and third terms, eight dollars each. The tuition is payable when name is entered at the beginning of each term. In order to become eligible for admission at the reduced rate, the student must have passed a satisfactory examination at the conclusion of his previous term.

The Pattern Making Department is under the supervision of a Trade School Committee appointed by the Master Pattern Makers' League of New York.

In practical work the course embraces the following divisions:

1. A series of exercises that will bring into use the various bench tools used for pattern making. The student is taught what the different tools are for, how to use and keep them in order. The exercises afford varied practice with the tools, so that the student acquires manual dexterity.

2. A complete course of joinery, making the student familiar with this important feature of pattern making.

3. Wood turning. Under this section the student is taught all about the lathe, its parts, how to regulate and control, what the wood-turning tools are, the purpose and use of each. Suitable exercises give necessary practice to enable the student to become familiar in working at the lathe and using the tools.

4. The following work in the line of pattern making is included in the full course, namely: Cylinders, pipe elbows and tees, core boxes, cone pulleys, propeller wheels, flywheels, parts of a lathe, various parts of machinery, and other practical work.

Drawing is taught in conjunction with the practical work. The student will prepare and make drawings of patterns, and work from same. This instruction will enable him to read plans and drawings readily, such as come before the pattern maker.

The scientific instruction includes the following subjects, namely: Woods and their grains, the best kind adapted for pattern making, drying and seasoning; metals, their weight and shrinkage; shrinkage of patterns and castings; wood bending; making cores, and the materials required; shellac varnish and why used.

The workshop is equipped with a modern plant of tools and machinery. The aim of the course is to give the student a broad and comprehensive knowledge of his trade.

In the course in Plumbing the scientific instruction, which is given

in addition to the work of a practical nature, includes the following subjects, and is usually covered by means of lectures: Drain, soil and waste pipes; trapping and ventilation of drain, soil and waste pipes; supply pipes; boilers, tanks; fixtures, trapping of fixtures; pumps; disposal of sewerage in country houses; water supply for country houses; miscellaneous; correcting diagrams of improper plumbing.

The series of lectures treating on the science of a trade are arranged with great detail and thoroughness. For each of the subjects printed forms are furnished, containing questions with blanks left for the answers. The lecturer reads a question and writes the answer on the blackboard this answer is then copied by the young men in the blank space on the printed form. The lecturer now proceeds to explain fully what is meant, to illustrate his meanings by diagrams, and to answer questions put by members of the class.

The school offers instruction in the following trades: House Painting, Fresco Painting, Sign Painting, Blacksmithing, Steam and Hot Water Fitting, Bricklaying, Plastering, Sheet Metal Work, Carpentry, Pattern Making, Printing, Electrical Work, and Plumbing.

THE BARON DE HIRSCH TRADE SCHOOL.

New York, N. Y.

The Baron De Hirsch Trade School in New York was established in the year 1885 for the fitting of Jewish young men, in as short a time as possible, to enter one of the mechanical trades as a means of livelihood. The school admits two classes each year, one in February and one in August, the number of students accepted averaging about one-quarter of the number who apply.

The students are assigned to courses for which they seem best adapted, taking into consideration their own inclinations as to the trade they wish to learn. The applicants are taken on trial for a period of fourteen working days. At the end of this period, if the applicant has shown that he possesses sufficient ability to learn a trade and has proved himself worthy of acceptance as a pupil, he is regularly enrolled as a member of the school.

The courses offered require five and one-half months for their completion, and no certificate is given to any pupil who does not remain throughout the entire course. The aim of the courses presented is to give the pupil a practical working knowledge of some trade. With this in view the first few months of each course are devoted to gaining a knowledge of the principles of each trade, and the latter months to practice showing the application of these principles. Shop methods and practice are followed as closely as possible, and each pupil is required to keep a note book in which all practical points covered by the instructor are copied. In so far as is practicable all work is executed from working drawings, and in order that the student may do this with intelligence he is required to take a course in mechanical drawing.

Instruction is provided in English for pupils who are unable to read or write that language. No certificate is granted to any student who cannot read and write a fair amount of English. At the satisfactory termination of any of the courses presented each graduate is given a kit of tools and a certificate stating that he has completed one of the courses offered by the school.

Instruction is offered in the following trades: Carpentry, Plumbing, Pattern Making, Electrical Work, Sign Painting, House Painting, Fresco Painting, and the Machinist's trade.

The following statistics will indicate in a measure the value of the work of the school. They are made up from reports received from the graduates of two recent classes. The total number of graduates in these two classes was 156, total number reporting 123. Of this number 95, or 77.2 per cent, are working at their trade; the remaining 28.8 per cent have no occupation or are engaged in other work. Of the total number of graduates 139, or 89.1 per cent, reported just after graduation. Of this number 124, or 89.1 per cent, had started at their trade. The average rate of wages immediately after graduation for these two classes was \$7.25. The average percentage of increase in nine months' time immediately after graduation was 28.7. These figures cover the machinist, carpentry, electrical, plumbing and painting trades.

Of the applicants admitted on trial an average of 30.4 per cent leave during the probationary trial, and of those regularly enrolled an average of 18.5 per cent leave during the time of the five and one-half months' course: the remaining 51.1 per cent receive certificates from the school. The causes for leaving the school are reported as follows: Out of 27 leaving the school during the probationary period 18.5 per cent left because of insufficient means of support; 40.7 per cent left because of shiftlessness; 22.4 per cent were compelled to go to work by their parents; 7.4 per cent left on account of sickness, and the remaining 11 per cent could not be located.

In sixteen classes the total number of graduates was 790. Of this number 121 are carpenters, 11 are turners, 25 are house painters, 130 are sign painters, 223 are plumbers, 191 are machinists, and 89 are electrical workers.

Evening free lectures are delivered in the general assembly hall of the school. In the year 1902-3 a course of twenty-six lectures was given on Physics, with a total attendance of 2,041, or an average of 78 persons to each lecture.

THE MANHATTAN TRADE SCHOOL.

New York, N. Y.

The Manhattan Trade School for Girls was opened in November, 1902. The thought which animated the founders of the school was the conviction that trades need skilled labor, and that working girls need to be skilled in order, adequately, to be fitted to meet that demand.

The aim of the school is, stated briefly, to give the poorest girl, upon leaving the grammar school, an opportunity to learn to be a skilled workwoman, in order, first, that her apprenticeship at the trade may enable her to take a shorter cut to decent wages than trade work itself will afford, and, second, that her appreciation of the meaning and value of the work of the world may be more intelligent than trade training alone would make possible.

The Manhattan Trade School for Girls is the first instance of the recognition of the need of women for special preparation as wage earners on the part of those members of the community who are interested in industrial education and the improvement in the conditions of the working class.

A working girl enters a factory immediately after leaving the grammar school, where she has received no special training which will enable her to demand even a living wage from her employers. She is put to work at the odds and ends of the trade which she enters and is given but little opportunity to acquire skill which will enable her to perform work of a nature which warrants the payment of even a living wage.

The problems of women factory workers have not awakened the same interest in the general public as have those of the men, largely, perhaps, because their employment at such work has been considered merely temporary, or because no such need for the payment of substantial wages to married women, who are supposed to derive a portion of their support from the wages of their husbands, has existed as in the case of male workers.

The conditions of girl workers in the sewing and basting trades in New York seem to the founders of the school to warrant an effort to make it possible for any girl with sufficient energy to prepare herself, before or after entering a trade, to do work of an expert order.

No tuition is charged at the school, and for those whose weekly wage is so indispensable that even free training would be prohibitive without some financial aid special provision is made. This provision takes the form of scholarships, or actual wages for marketable products manufactured by the pupils of the school. An inexperienced girl may earn as much as \$100 per year, while skilled workwomen can earn as much as \$300 per year. The school depends for its support entirely upon voluntary subscription, and is not connected with the municipality or any society. The interest of working women has been so aroused in the work of the school that numerous working girls' clubs associated in the Wage Earners' Auxiliary have raised \$100 each for purposes of student aid. The expenditure for all purposes last year was upwards of \$37,000.

The school year opens in July and continues throughout the year. Advantage is thus taken of slack seasons in trade for offering instruction, and of busy seasons for testing and placing in workrooms those girls who are preparing to enter the trades. The summer months are a time of apprenticeship for the inexperienced workers entering at that time. Those who show ability and earnestness are given opportunity to continue the work in the fall. A month's apprenticeship is required for those entering at other times of the year.

The present work of the school has to do with those trades which group themselves about the needle, the paste brush, and the foot and power sewing machines. As soon as the pupil can control her chosen tool specialization begins in the trade for which she is best fitted, every effort having been made to discover the natural aptitude of each pupil. As rapidly as the pupil masters one step in her trade she is advanced to the next, her progress depending upon her own ability and industry.

The departments are organized as follows: A supervisor is in general control of a department. Under her there are trade teachers with practical experience in their lines of work who, together with the assistants, give the instruction. The instructors aim to provide the pupils with knowledge of those kinds of work only at which they are likely to be employed after entering a factory. They are careful to avoid giving the pupil so much instruction that she will possess no peculiar skill in any detail of the work, and will object to being placed at a lower order of work when she enters a factory than her experience at the school may lead her to suppose she is fitted for.

In addition to the trade work and trade instruction which occupies a large part of the day, the pupils are required to take work in business practice, English, industrial history, and physical culture. In the course of Industrial History the aim has been to awaken an interest in the trade in which the girl is engaged that she may understand her relation to it, and its relation to the industrial world. The conditions of New York city are first investigated, and through the knowledge of her own surroundings the pupil is led to a general appreciation of the conditions elsewhere. The raw materials upon which she works in her trade, the conditions of their growth, the processes of their preparation, the inventions, and the commercial routes by which such materials are brought to New York are each studied. These are all illustrated by the raw

and manufactured materials, pictures, and by maps prepared by the girls.

The number of pupils admitted to the school is limited by reason of space and funds to about 100, and in order that those who do enter may do so with earnest purpose and leave the school benefited by its instruction the following rules relative to admission are in force: 1. The pupil must signify her intention of becoming self-supporting. 2. She must be over 14 and under 17 years of age. 3. She must apply in person. 4. She must bring references from some reliable person. 5. She must show record of attendance upon school for the number of days required by law. 6. She must be able to obtain a certificate of birth if under 16 years of age.

The school is in session every week day except Saturday during regular business hours, with one hour at noon for lunch and recreation. During the first year a night school was maintained for the benefit of women who are employed during the day, but for the last several months has not been continued because of insufficient funds, although there is a great need for such courses of instruction.

The school is watched by educators and students of social problems everywhere with great interest. It has already proved to its founders the validity of the assumption which led to its organization. A number of girls have actually been helped through its agency, and an increasingly large number are seeking admission to its classes. The employers in the garment and paper trades are beginning to call upon the school for workers, and although they were at first unwilling to admit the justice of the demand of the graduates of the school for a higher class of work and better wages than are usually given to girls beginning in the trades, they are now in some instances recognizing that it is safe and practicable to do so.

The school does not intend to limit its work to lines which it has already taken up, but will seek to widen the range of its work with the increase of the demand and interest on the part of the public. That it is entering a vitally important field of work there can be no question; in respect to the garment trades, at any rate, the work of the school is the logical complement of the anti-sweat shop enactments.

PRATT INSTITUTE.

Brooklyn, N. Y.

Pratt Institute was established 1887 by Mr. Charles Pratt, of Brooklyn, for the promotion of manual and industrial education, and for cultivation in literature, science, and art. It seeks to inculcate habits of industry and thrift, and to foster all that makes for right living and good citizenship, and to aid those who are willing to aid themselves.

The liberal endowment of the Institute makes it possible for it to charge a merely nominal tuition, and at the same time secure highly efficient teachers, and to provide them with equipment of a superior order.

The Institute conducts both day and evening classes, into which both sexes are admitted on an equal footing. The work has three distinct ends in view: 1. General Education, the purpose being the harmonious development of the faculties, as in the work of the High School. 2. Normal; the aim being the preparation of the student to become a teacher. 3. Technical or special training; to secure practical skill in the various branches of the fine, industrial, and domestic arts, the handicrafts, the applied sciences, and the mechanical trades.

The various courses are as follows:

DAY COURSES.

HIGH SCHOOL.

Manual Training Course.

NORMAL.

Art.	Art and Manual Training.
Domestic Art.	Domestic Science.

KINDERGARTEN.

Full-Time Courses.

General Art.	Millinery.
Architecture.	General Course in Domestic Science.
Design.	Steam and Machine Design.
Sewing.	Applied Electricity.
Dressmaking.	Kindergarten Methods.
Art Needlework.	Library Science.

Part-Time Courses.

Leather Carving.	Millinery.
Wood Carving.	Basketry.
Art Metal.	Cookery.
Sewing.	Serving.
Dressmaking.	Laundry Work.
Art Needlework.	Kindergarten Methods.

Physical Training for Women.

EVENING COURSES.

Freehand Drawing.	Physics.
Rendering of Historic Ornament.	Chemistry.
Life Drawing.	Applied Electricity.
Design.	Mechanical Drawing.
Architectural Drawing.	Mechanism.
Art Metal Work.	Steam and Steam Engine.
Wood and Leather Carving.	Strength of Materials.
Clay and Wax Modeling.	Carpentry.
Sewing.	Machine Work.
Dressmaking.	Plumbing.
Costume Design.	Sign Painting.
Millinery.	Fresco Painting.
Basketry.	Physical Training.
Cookery.	Serving.
Laundry Work.	

SATURDAY COURSES FOR SCHOOL CHILDREN.

Drawing.	Art Needlework.
Manual Training.	Basketry.
Sewing.	Cookery.

Physical Training for Girls.

The following are the several departments of the Institute: High School, Department of Fine Arts, Department of Domestic Art, Department of Domestic Science, Department of Kindergartens, Department of Libraries, and the Department of Science and Technology.

For the purposes of this report it will be sufficient to consider the work in the Departments of Domestic Art, Domestic Science, and Science and Technology. In the Department of Domestic Art comprehensive courses of study are provided in those branches which are related to the healthful and appropriate clothing of the body, and to household decoration. The day courses in this department are: A normal course in do-

mestic art, sewing, dressmaking, millinery, art needlework, costume design, and basketry. In the evening classes sewing, dressmaking, millinery and basketry are taught. The work in these courses is divided between practical, accurate work and instruction by means of lectures. Particular attention is paid to the training of the women students to care for homes and to meet the practical problems which are involved in economical housekeeping. Technical courses are, however, provided for those students who wish to employ their training for professional use, but it is made clear that the work in these courses can serve only as the foundation for future experience.

In the Department of Domestic Science courses are offered which afford training in the subjects which pertain to life in the home. The day courses in this department are as follows: Normal course in Domestic Science and Art, general course in Domestic Science, Cookery, Serving and Laundry Work. The evening courses are: Cooking, Serving and Laundry Work. While considerable practical experience is given in these courses which would enable those who follow them conscientiously to use the knowledge which they thus acquire, as a means of livelihood, the work is largely regarded as character training and preparation for domestic life. In both the Departments of Domestic Science and Domestic Art special emphasis is laid upon the training of students who wish to become teachers in one of the several subjects which they offer, and the thoroughness of instruction has awakened a constant demand for teachers in Domestic Science and Art who have received their training at Pratt Institute.

The Department of Science and Technology provides courses of study in mechanical and electrical lines, which are intended to prepare young men for important positions in draughting room and workshop. The department does not seek to train journeymen for factory and trade work so much as it aims to prepare its students for positions as foremen, assistant superintendents, and specially skilled workers in the industries. The courses given in this department are as follows:

TWO-YEAR DAY COURSES.

Steam and Machine Design. Applied Electricity.

EVENING TECHNICAL AND TRADE COURSES.

Physics.	Mechanism.
Chemistry.	Steam and the Steam Engine.
Applied Electricity.	Strength of Materials.
Mechanical Drawing.	Plumbing.
Carpentry and Pattern Making.	Sign Painting.
Machine work.	Fresco Painting.

The Evening Trade classes furnish a thorough and practical training in the various trades which is designed to be of immediate value to every one attending them, by giving the members of the classes greater skill and accuracy and a knowledge of the technical points of their trades. These classes are limited to students between 16 and 25 years of age, and they meet on three evenings of the week from October to April. These courses are attended very largely by journeymen who find in them a valuable aid in their advancement to positions of greater responsibility. A very small number of the students in the night classes are without some practical experience in the work which they take up at the Institute.

The Pratt Institute is primarily an educational institution wherein hand training has been made an important part of the curriculum. The instruction which it offers in commercial subjects is intended, very largely, to supplement practical experience, or to provide with special information those persons who are seeking to equip themselves for work requiring more advanced training than is necessary for mere journeymen mechanics.

THE NORTH BENNET STREET INDUSTRIAL SCHOOL.

Boston, Mass.

The North Bennet Street Industrial School deserves notice because it, in many respects, was the pioneer in introducing industrial work into the common school system of Boston. Its organization resulted from the success attending upon the establishment of kindergartens in Boston, and its existence is due, in a large measure, to the steadfast interest in its development of the woman through whose enthusiastic public spirit the incorporation of the kindergartens into the school system, and later the industrial educational activities, was made possible.

The work of the school in no way resembles the scope and method of the trade school, although numerous instances exist of boys and girls earning their livelihood in the arts with which they first became acquainted in the classes of the school. The work is designed to meet the needs of a crowded slum population in the north end of Boston, where are centered large numbers of immigrants from Italy and Jewish Russia. The children of these people are here taught in evening classes how to use their hands in the simple domestic arts and the artistic crafts. Classes are provided in clay modeling, wood and other carving, sloyd and cabinet work, cooking, millinery, printing, and freehand drawing. The charges for tuition are entirely nominal, so that no child is prohibited from the advantages which attendance upon any of the classes may bring him.

Not only does the school conduct evening classes, but in co-operation with the neighborhood city schools, it furnishes instruction to classes sent to it by these schools in such work along industrial lines for which the Board of Education has not made provision. The example and efforts of the North Bennet Street Industrial School in this connection have resulted in the provision for industrial work in those schools which have been most intimately affected by its influence.

A vacation school is conducted in addition to the regular winter activities, which reaches a large number of children, and supplies them with beneficial and interesting employment at times when they would otherwise have to seek recreation and entertainment in the streets.

The teachers in the school take an active interest in the problems of the community in which the school is located, and play an important part in the solution of the many problems which rise from the herding together of a large number of immigrants in an old and unsanitary portion of the city.

THE LOWELL TEXTILE SCHOOL.

Lowell, Mass.

The Lowell Textile School was opened in January, 1897, for the purpose of providing thorough instruction in the theory and practical art of manufacturing all fibres known to the textile industry. The plan of the school is largely adopted from similar institutions in European countries, but it differs from these institutions in the breadth of its curriculum. Its establishment resulted from the interest in the work of these foreign schools, on the part of the manufacturers of fabrics and textile machinery, whose industries are, perhaps, the most important of this region. The incorporators are mainly representatives, either as president, treasurer, agent, or superintendent, of the textile manufacturing corporations of Lowell, Lawrence, and the vicinity, in the Merrimack Valley, with an aggregate capital above sixty-five million dollars. By the terms of the

By-Laws at least three-quarters of the Trustees must be "persons actually engaged in or connected with textile or kindred manufactures." This provision was designed to insure the practical character of the management and the instruction.

The institution is now housed in four large buildings of the modern mill type, which are adapted to the purposes of the School. The equipment includes a large variety of machines for the manufacture of textiles and the preparation of fibres, and a special effort has been made to place in the School every type of machine which the American textile manufacturer may require. The School has a more varied equipment than any other existing textile school, either in America or Europe.

The aim of the School is not to educate professional scientific men, but to offer instruction which will be of service in industrial and commercial undertakings; but the School offers to graduates of universities and scientific institutions the advantages of technical instruction in the practical application of certain sciences.

Both day and evening classes are conducted. The day classes are designed for those who intend to enter the business of textile manufacturing in any branch. The evening classes provide instruction for those who are engaged during the day in mills and workshops, thereby enabling those who wish it to perfect their knowledge of the branches in which they work, or to acquire knowledge of other processes than those in which they are regularly engaged. It is possible for members of the evening classes in the course of several winters to complete a thorough technical education without interfering with their daily duties. In some instances, however, local manufacturers have permitted a number of their employees to attend classes in the School during working hours for several periods a week.

The regular courses for day students are as follows: 1. Cotton Manufacturing. 2. Wool Manufacturing. 3. Designing. 4. Chemistry and Dyeing. 5. Weaving.

The evening courses are: 1. Cotton Spinning. 2. (a) Woolen Spinning; (b) Worsted Spinning. 3. Designing. 4. Chemistry and Dyeing. 5. (a) Warp Preparation; (b) Weaving. 6. Mechanical Engineering Instruction is given by means of lectures and practical work, but particular emphasis is laid upon the practical execution of the theories taught.

B

APPENDIX.

	PAGE.
Note on Hebrew Technical Institute, New York, N. Y. -	49
Note on Apprenticeship System at Baldwin Locomotive Works, Philadelphia, Pa. - - - - -	49
Note on Apprenticeship System at Richard Hoe and Co., New York, N. Y. - - - - -	51
Note on Apprenticeship System at Brown and Sharpe, Providence, R. I. - - - - -	52
Note on Apprenticeship System at Westinghouse Electrical Co., East Pittsburgh, Pa. - - - - -	53
Note on N. O. Nelson Mfg. Co., Leclair, Ill. - - - - -	53
Note on Winona Trade and Technical School, Indianapolis, Ind.	54
Note on The Philadelphia Commercial Museums, Philadelphia, Pa.	54
Note on Spring Garden Institute, Philadelphia, Pa. - -	55
Factory Education, Henry Bruere, reprinted from The Commons June 1904 - - - - -	56

APPENDIX.

HEBREW TECHNICAL INSTITUTE.

New York.

NOTE.

The Hebrew Technical Institute is a school of twenty-one years' standing, for the education of Jewish young men in the mechanical arts. The Institute offers a three years' course for a complete and thorough training in the trades, which is intended to take the place of the Apprenticeship System. Evening classes are also conducted for men at work in the trades and have proved unusually successful.

The Institute was established by Hebrews, and receives its entire support from the members of the Jewish race.

The enrollment for 1903 was 211, with an average daily attendance of 173. Of the entire number enrolled, 101 were in the First Class and 46 in the Senior Class, with 64 in the Middle Class. Out of 34 graduates in a recent class, 14 were graduated from the Electrical Department, 11 from the Drawing Department, 5 from the Metal Working Department, and 4 from the Woodworking Department.

The total number of living graduates is 416. Of 372 reporting 261, or 70 per cent, are following mechanical work. The average weekly earning of the class of 1886 is \$45 for each member; of the class of 1902 the average weekly earning is \$7 for each member. The averages for the classes between the years 1902 and 1886 show a steady and regular increase in earning capacity with the length of time of actual experience in the trades.

THE BALDWIN LOCOMOTIVE WORKS.

NOTE.

Philadelphia, Pa.

Burnham, Williams & Co., manufacturers of the Baldwin Locomotives, have developed a thorough Apprenticeship System for the training of skilled workers along the lines which their industry requires. A special Foreman of Apprentices has been appointed, whose duty it is to keep in touch with every indentured young man, and to see to it that his training is well rounded by preventing his being kept at one detail for a greater length of time than the acquisition of proficiency at that particular work necessitates.

The following is the official statement of the company concerning its Apprenticeship System:

APPRENTICESHIP SYSTEM.

In recent years manufacturing has tended so largely toward specialization that young men apprenticed to mechanical trades have been able in most cases only to learn single processes, and, as a result, the general

mechanic has threatened to become practically extinct, to the detriment of manufacturing interests generally. In view of this fact the Baldwin Locomotive Works have established a system of apprenticeship on a basis adapted to existing social and business conditions.

Apprentices are taken in three classes, as follows:

APPRENTICES OF THE FIRST CLASS.

The first class will include boys seventeen years of age, who have had a good common school education, and who will bind themselves by indentures (with the consent of a parent or guardian in each case) to serve for four years; to be regular at their work; to obey all orders given them by the foreman or others in authority; to recognize the supervision of the firm over their conduct out of the shop as well as in it; and to attend such night schools during the first three years of their apprenticeship as will teach them, in the first year, elementary algebra and geometry; and in the remaining two years, the rudiments of mechanical drawing.

APPRENTICES OF THE SECOND CLASS.

The second class indenture is similar to that of the first class except that the apprentice must have had an advanced grammar school or high school training, including the mathematical courses usual in such schools. He must bind himself to serve for three years, and to attend night schools for the study of mechanical drawing, at least two years, unless he has already sufficiently acquired the art.

APPRENTICES OF THE THIRD CLASS.

The third class indenture is in the form of an agreement made with persons twenty-one years of age or over, who are graduates of colleges, technical schools, or scientific institutions, having taken courses covering the higher mathematics and the natural sciences, and who desire to secure instruction in practical shop work.

The indentures or agreement in each case place upon the firm the obligation to teach the apprentice his art thoroughly and to furnish him abundant opportunity to acquire a practical knowledge of mechanical business. The firm is also bound to retain the apprentice in service until he has completed the term provided for in the indenture or agreement, provided his services and conduct are satisfactory. In all cases the firm reserves the right to dismiss the apprentice for cause.

The rates of pay in the different classes are as follows:

	1st year per hr.	2d year per hr.	3d year per hr.	4th year per hr.
Apprentices of the First Class.....	5c	7c	9c	11c
Apprentices of the Second Class.....	7c	9c	11c	...
Apprentices of the Third Class—				

First 6 months of first year, 13c per hour.

Second 6 months of first year, 16c per hour.

First 6 months of second year, 18c per hour.

Second 6 months of second year, 20c per hour.

In addition to the rates mentioned above, apprentices of the first class each receive an additional sum of \$125, and apprentices of the second class an additional sum of \$100, at the expiration of their full term of apprenticeship respectively.

By the course of training provided for in this system it is believed that a great benefit will accrue to the mechanic as well as to the employer. To young men who have received a thorough technical education, the two years' course in shop work is especially recommended.

Further particulars will be given on application.

BURNHAM, WILLIAMS & Co.

RICHARD HOE & CO.

NOTE.

New York.

Richard Hoe & Co. conduct a night school for the benefit of their apprentices, in which indentured boys in their employ are giving instruction to supplement their shop experience at the company's expense. Richard Hoe & Co. manufacture a high class product, such as printing presses, saws and various intricate machines, and for the successful continuance of their business they must be able constantly to fill any vacancy which may occur in the ranks of their expert workers.

The following is the full form of the Apprentice's Engagement used by this company, and the Rules and Regulations for Apprentices, which the company enforces:

APPRENTICE'S ENGAGEMENT.

New York,, 190..

The undersigned,, with the consent and approbation of his parents or guardians, parties to this agreement, in consideration of the sum of One Dollar paid to him, the receipt of which is hereby acknowledged, agrees and binds himself to serve a full term of five years' apprenticeship with R. Hoe & Co., Printing Press Manufacturers, 504-520 Grand Street, New York, receiving weekly wages as follows:

For the first six months.....	\$2.50
For the second six months.....	3.00
For the second year	3.50
For the third year	4.50
For the fourth year	5.50
For the fifth year	7.00

Three hundred and five days are to constitute a year's work.

He agrees to perform his duties with fidelity and punctuality and to conform to all the rules and regulations of the firm and as printed on the third page of this Agreement.

R. Hoe & Co. agree to give him every opportunity to learn the trade of and the advantages of their night school, without charge.

The apprentice,, agrees to attend this school, as required by R. Hoe & Co.

At the end of the fifth year a diploma will be awarded to him by R. Hoe & Co., stating that he has served the full term of apprenticeship and giving his status as a workman.

The right is reserved by R. Hoe & Co. to cancel this agreement, and discharge the said for cause, either carelessness, disobedience of orders, unsteadiness or inefficiency, and it is understood that in this case no obligation is incurred by R. Hoe & Co. toward the said apprentice.

Apprentice's Signature
Address

Witnesses: Age
.....
.....

We (I) (parents or guardian) agree that our (son or ward) shall serve the firm of R. Hoe & Co. upon the terms specified above.

Witness my hand and seal this day of 190..
Signatures of Parents or Guardian.
.....
.....

RULES AND REGULATIONS.

No apprentice will be employed who is less than sixteen or more than eighteen years of age. He must be physically sound, of good moral character, and have attended school at least four years. He must be accompanied by his parents or guardian, who shall sign this agreement with him.

The term of apprentice's trial is 30 days. If at the end of that time he has been satisfactory, and he then signs with his parents an agreement to fulfill his apprenticeship, he will be paid for the month of trial, and this will count in as part of his apprenticeship. On the other hand, if he is rejected for any reason, and he does not sign the apprenticeship papers, he is to receive nothing for the month's trial.

A rating shall be kept by each foreman, and any apprentice receiving for efficiency and deportment a rating of ninety-five per cent, out of one hundred per cent, shall be allowed two weeks, with pay, in each year, which may be deducted from his term of apprenticeship, or taken as a vacation.

If he performs his duty with fidelity and punctuality, he shall fully participate in the piece-work earnings of his gang; but if he should fail to do so, his foreman may charge 50 cents per week against him, to be deducted from the piece-work earnings, which shall be held by the firm, to be paid as a bonus to the ten apprentices (apportioned equally) who make the highest rating, at the termination of their apprenticeship. The division of this fund, should there be any, will be made in January to the apprentices having finished their term during the previous year.

When an apprentice, either through carelessness or disobedience of orders, breaks a tool or spoils work, the firm reserves the right to charge against him such time and impose such penalty as in its discretion may seem just and proper. All tools delivered to an apprentice must be returned to the tool-room or paid for by the apprentice.

He shall make up all lost time, and no new year of service shall commence until he shall have worked a full twelve months, which shall not include lost time or time charged against him the preceding year.

The use of tobacco and spirituous liquor on the premises is strictly forbidden.

Before an apprentice is discharged, for cause, his parents shall be duly notified and given a chance to show cause why he should not be discharged.

 BROWN & SHARPE CO.

NOTE.

Providence, R. I.

Brown, Sharpe & Co. are manufacturers of machine tools, and therefore are constantly in need of high class workmen. For the purpose of supplying this demand they have established an Apprenticeship System, and appointed a Foreman of Apprentices for the supervision of the instruction of the indentured boys.

There are at present 112 apprentices in the company's employ who have been selected by the Foreman from a large number of applicants as boys who are likely to take earnest advantage of the opportunity for learning a trade which the Apprenticeship System affords them. A preliminary knowledge of arithmetic is required and each boy is given a test in the elementary branches of this subject before he is indentured. After this he is consigned to one of the several departments and put to work at simple processes. When he has acquired sufficient skill he is

transferred to a lathe and kept there for a year. He is then, if he has proved sufficiently capable, given experience in the other branches of the machinists' trade. In addition to the regular machine shop work, he receives instruction in smithing and forging.

While there is no fixed course of training, a general standard is maintained, and every boy must meet its requirements. This standard has been set by the actual performances in the different departments by former apprentices, and is in no way arbitrarily determined by the company.

The company provides a library of mechanical works and fiction, which the boys are encouraged to use and to which they are frequently referred for special reading on their trades. There is, however, no special educational requirement as exists at the Baldwin Locomotive Works and the Richard Hoe & Co. factory.

An Apprentices' Association exists, which meets bi-weekly, for a part of the noon hour, to discuss and debate matters of interest, or to hear lectures on the trades.

The apprentices are, from the start, employed on piece work.

THE WESTINGHOUSE ELECTRICAL COMPANY.

NOTE.

East Pittsburg, Pa.

In the year 1902 the Westinghouse Electrical Company, of East Pittsburg, Pa., invited its apprentices to take instruction in mechanical drawing, which the company offered to provide at the factory. The classes in mechanical drawing proved so successful that before the end of the year a Technical School had been established, and is now conducted every night in the week, immediately after work, by the employees themselves, with the active co-operation of the company.

The nature of the work at the Westinghouse plant requires high intelligence and workmen thoroughly trained in the science of electricity, as well as in the mechanical processes employed in the manufacture of electrical machinery. The classes are, therefore, designed to give to the apprentices who are not graduates of the technical schools acquaintance with the mathematics upon which their work depends, and with the science of electricity.

The instructors in the School are the experts in the employ of the company, a number of whom have had experience as teachers before entering commercial work.

N. O. NELSON MANUFACTURING COMPANY.

NOTE.

Leclair, Ill.

Mr. N. O. Nelson, owner of the Nelson Manufacturing Company, has recently opened a school for his apprentices where they may receive instruction in academic, agricultural, and technical subjects.

The object of the School is more largely humanitarian than industrial, and the work is designed to provide for the wholesome recreation and the general development of boys at work in the factory, rather than for the development among them of special skill.

The School is conducted during the day, and a part of the apprentices' working hours must be devoted to educational work.

THE PHILADELPHIA COMMERCIAL MUSEUMS.

NOTE.

Philadelphia, Pa.

The Philadelphia Commercial Museums are interesting from the point of view of industrial education, because they exhibit the commercial products of almost every manufacturing nation in the world, showing the evolution of these products, and how raw material may be used for a large variety of commercial purposes.

On the 1st of June of this year the Museums were installed in several of the large buildings which were erected at the time of the National Export Exposition, in 1876, for exhibition purposes. Perhaps nowhere in the world is there so large and interesting an exhibit of commercial products, and any industrial school will do well to provide itself with similar collections, though on a smaller scale, to supplement their trade instruction. In this manner the student can be given a wide outlook upon the field of manufacturing, and is made to appreciate the bearing of his trade upon the commerce of the world.

Commercial museums have already been installed in a number of the Industrial Institutes, as, for instance, at the Drexel Institute, described above.

THE TRADES SCHOOL OF THE WINONA TECHNICAL INSTITUTE.

NOTE.

Indianapolis, Ind.

The Trades School Department of the Winona Technical Institute will open for the reception of scholars on Wednesday, September 21, 1904. The school year will continue for nine months, divided into semesters. The school and shops will be in session seven hours daily on five days of the week and three hours on Saturday, each scholar having approximately thirty hours' shop practice weekly.

The school is established for the purpose of giving deserving boys training in habits of morality and industry and for teaching them mechanical trades. While the technical training will be of the highest order, the trustees consider it to be quite as essential to have the pupils good men as good mechanics, and especial attention will be given to their moral training. The Bible will be the principal text-book in such training. The school is non-sectarian, but each pupil immediately after admission will be required to designate the religious denomination of his choice, and thereafter attend its services regularly at its place of worship.

No pupils will be received who are under sixteen years of age. Applicants are required to pass scholastic, moral and physical examinations and from those successful in such examinations selection will be made of the number the school can accommodate. No one will be accepted who is not able-bodied, intelligent, healthy, and possessed of natural aptitude and liking for mechanical work. Candidates to be admitted must also be of good moral character and sufficiently educated to enter intelligently upon the school work.

The requirements for admission include reading, writing, spelling and arithmetic (as far as fractions and interest). Certificates from superintendents of public schools showing the successful pursuit of these branches by the candidate will be accepted as meeting the above examination requirement. The requirements as to moral character will be satisfied by

the certificates of three adults (teachers preferred) who are thoroughly acquainted with the applicant. The physical examination will in all cases be made at the school, its purpose being to determine the ability of the applicant to meet the physical requirements of the course in the selected trade, and also to guard against the admission of any pupils with contagious or transmissible diseases.

The trades offered for the year 1904-5 are as follows: Carpentry, Bricklaying and Masonry, Plastering, Blacksmithing, House and Sign Painting, Ornamental Painting, Plumbing, Steam and Hot-water Fitting, and Electrical Work. Each scholar takes but one of the trades named and his instruction in mechanical and free-hand drawing bears in a general way upon his particular trade. Special night classes in electrical work and mechanical drawing will be given during the school year of 1904-5. Arrangements will also be made for night classes in other trades if the demand warrants. In no cases will pupils be permitted to board in places other than those approved by the school authorities as furnishing healthful and safe surroundings. Non-resident pupils will be under the control of the faculty not only during school hours, but also at all times during their connection with the school.

It is the belief of the trustees that a fundamental part of the training in a Trades School is the development of that self-respect upon the part of the pupil that can only come through feeling that in his school work he is not the recipient of charity, but that in some measure he pays for that which he receives. The idea of self-support should be fostered in every possible way, and it will be the constant aim of the school to create an unwillingness on the part of its pupils to receive that for which they make no return. For this reason the tuition in the Trades School is placed at \$100 for the full year of nine months or \$60 for a single semester. This tuition includes all tools and materials used in the course selected by the pupil.

A certain number of scholarships have been placed at the disposal of the President, which makes it possible to admit students of exceptional qualifications who may not be able to meet the tuition requirements. When such scholarships are granted, opportunity will be given the recipient to reduce the amount received by work done outside of the regular school hours.

The authorities of the school may at any time dismiss a pupil for incompetency or bad conduct, or if for any reasons his further continuance in the school is deemed undesirable. In such cases there will be no rebate of tuition. The school does not undertake reformatory work and it would be unwise for students not readily amenable to direction and guidance to enter the school.

THE SPRING GARDEN INSTITUTE.

NOTE.

Philadelphia, Pa.

The Spring Garden Institute of Philadelphia, incorporated 1851, opened workshop schools during the year 1891, in which the pupil works eight hours a day, as in a shop. The great success attained—the pupils being as far advanced at the end of nine months as in a manual training school at the end of three years—has led to the continuance of this system of instruction. Those who desire simply to learn the use of tools can do so in one year, but those who wish thorough mechanical training for which a diploma can be granted are required to attend at least three years.

No trade is taught. In one shop instruction is given in general metal

work; in the other, in general wood work. Pupils are entered as students of Mechanical Handiwork, and are assigned to either wood or metal working for the first term. At the close of the first term the classes are shifted so that at the conclusion of the second term all pupils have received elementary training in both wood and metal working. The pupils then make choice, under advice of their teachers, of the class which they desire to enter, and thereafter practice wood working or metal working as a specialty. This rule is made because it is desirable to have mechanics, and especially electricians, familiar with the methods of working both wood and metal. But pupils are required at the end of the second term to take up a specialty, because of the great benefit to be obtained from continuous practice with one kind of tools.

The day classes are as follows: Free-hand Drawing, Modeling, Designing, Mechanical Drawing, Mechanical Handiwork, and Applied Electricity. The night classes are as follows: Mechanical Drawing, Free-hand Drawing, Designing, Architectural Drawing, Mechanical Handiwork, and Applied Electricity. The tuition in both day and night courses is merely nominal.

FACTORY EDUCATION: A STATEMENT OF THE CASE.

BY HENRY BRUERE.

The American community has not yet discovered a practicable means of equipping sons of workingmen for broad, serviceable lives as workingmen. In our public institutions for higher education we have limited ourselves, customarily, to training men for the learned vocations, for the professions, wherein the possession of a liberal education is not repugnant to the tasks to be performed. A possible exception to this rule may lie in the agricultural college, but institutions of this nature are not primarily intended for men who perform the mere drudgery of farming, the agricultural laborers. Further than this, farming is peculiarly a public interest, the basis of our economic activities, and, therefore, a vocation of greatest importance to the community as a whole. However, agricultural education is directed toward the improvement of the agricultural resources of America, rather than toward the enrichment of the lives of American farmers. It is technical education, aiming at increased productiveness of lands, and the maintenance of fertility through the heightening of efficiency among farmers. Broadly speaking, colleges of agriculture are likely to create a class of captains of agriculture, analogous to the managers of our large industries, who by means of an acquaintance with the technique of their vocations are enabled to direct the unskilled and uneducated laborer in the processes of manufacture or cultivation.

The point of view from which elementary education has been carried on is cultural. The children of society are taught to read and write and the elementary facts of life for developmental purposes. While there are wide differences in methods, elementary education is generally designed, from the child's point of view, not for the cultivation of particular aptitudes in children, or even for their discovery, but, merely, to supply them with the barest necessities of competitive life in a modern society.

Our enlightened communities enforce attendance at school during the formative period of a child's life. The child of the working class, at any rate, is not free to elect the kind of education he shall receive during these formative years, nor can his parents choose for him, except between the more or less enlightened instruction in the public grammar schools and the usually old-fashioned curricula of the parochial schools. On attaining the statutory age the child is theoretically prepared to earn his living, and

in the majority of cases the struggle for a livelihood must commence at this point.

With the general and limited lump of information derivable from attendance in a grammar or parochial school, the boy finds himself submerged in the detail of a manufacturing plant. He has found a job and has, at length, set out in earnest to pay his way in the world. Because he is a boy and limited in strength he receives lower wages than the man next him who is called upon to exercise no greater intelligence or initiative than he and is, perhaps, actually less intelligent. The work he does is, simply, work, non-developing at best and, at worst, stultifying. It is repetitious piece-work in which he performs processes with the aid of semi-automatic machinery, unrelated in his experience to any organized activity, except in so far as he understands that others are doing similar work in order that a certain salable product may be created. Even when the process which he supervises results in a finished article—that is, when the process is final in a series of processes, as, for instance, the balling of twine or sealing of a package—the repetition deadens the imaginative interest. The child is now no longer subjected to influences giving him an opportunity for mental growth, nor, on the other hand, is he able to cultivate special skill which will enable him to command a stronger economic position, and with it increased opportunity for growth as a result of the nature of the work he is enabled to perform.

Here the limit of society's concern seems to have been reached. The child has been provided at the public expense with the traditionally necessary equipment for competition on the one hand, and the supposed anti-toxin to bad citizenship on the other. For the industrial class the question ceases at this point to be one of good-citizenship and becomes one of economic fitness. But the apparent interests of the modern manufacturing establishment seem opposed to the cultivation of this fitness beyond the degree already secured by society, namely, a practice of the simple virtues of obedience, honesty, regularity and reasonable precision, inculcated by the grade schools. A steadfast adherence to these principles of conduct is made the condition of job-tenure, and soon results in the monotonous subordination of the spirit of the child to the controlling forces of the factory.

So long as the job is held and wages sufficient for the maintenance of life are paid, the range of the factory worker's initiative is limited to his activities out of working hours. With the child, these are further controlled, to a very large extent, by his parents, and, in some instances, by the church. This parental and religious control is again directed toward the cultivation of passivity, toward submissive obedience, honesty and fear of punishment.

The problem which arises here is in regard to the inquiry: Can society afford to look on the probable waste of capacity in this manner indifferently? On the other hand, may a community permit the restriction of individual growth without forfeiting its self-respect? The problem, while it is a single one, involves especially these two questions: a question of commercial expediency, and, secondly, a question of moral development. As a commercial organization, as an economic body, are we so abundantly supplied with capable workers that we can afford to be profligate with the material out of which capable workers are to be made? Is there no folly in permitting a boy with latent capacity for skilled or executive work to deaden his energies and quiet his ambition in the performance of meaningless work? A very reverend and delightful gentleman writing recently in the *Atlantic* in a burst of enthusiasm over the increased dignity of labor in America, ventures the remark that "the great factory not only educates the man who runs it, but every boy who tends a lever or minds an engine." This, of course, is another instance of the old fallacy which gave rise to the conception of the "noble savage." Nature to be ennobling must be understood, and in a manner comprehended; just so with

"wheels and bands," which do not educate unless they are understood and their activities comprehended.

A great deal of the work done in our factories by boys is done without mental concentration on the work in hand. It is done automatically, mechanically, the muscular forces of the tender co-operating with the device of the machine. A foreman of a large shop told me the other day that some of the men in his department had operated the machines at which they were then working for ten or more years, and that no single man who had become accustomed to his job was willing to be transferred. The work done was largely supervisory; that is, machine tending, requiring no original thought on the part of the operator. The obligation to readjust his mental machinery incurred by transference to a new job, counteracted the average man's desire for variety of experience. It scarcely requires argument to convince one of the fact that machine tending of this nature is not an educative process; it neither gives satisfaction to the tender by affording him an opportunity for self-expression, nor does it develop in him marketable skill. Intellectually, in so far as his work is concerned, the boy at eighteen is in no way the superior to the boy at fourteen. He may be more regular in his activity—that is, he may work more days in the year—he may turn out a greater number of pieces a day, on the average—but he is capable of no greater or new self-expression in his work, nor of work of a higher order because of his activity.

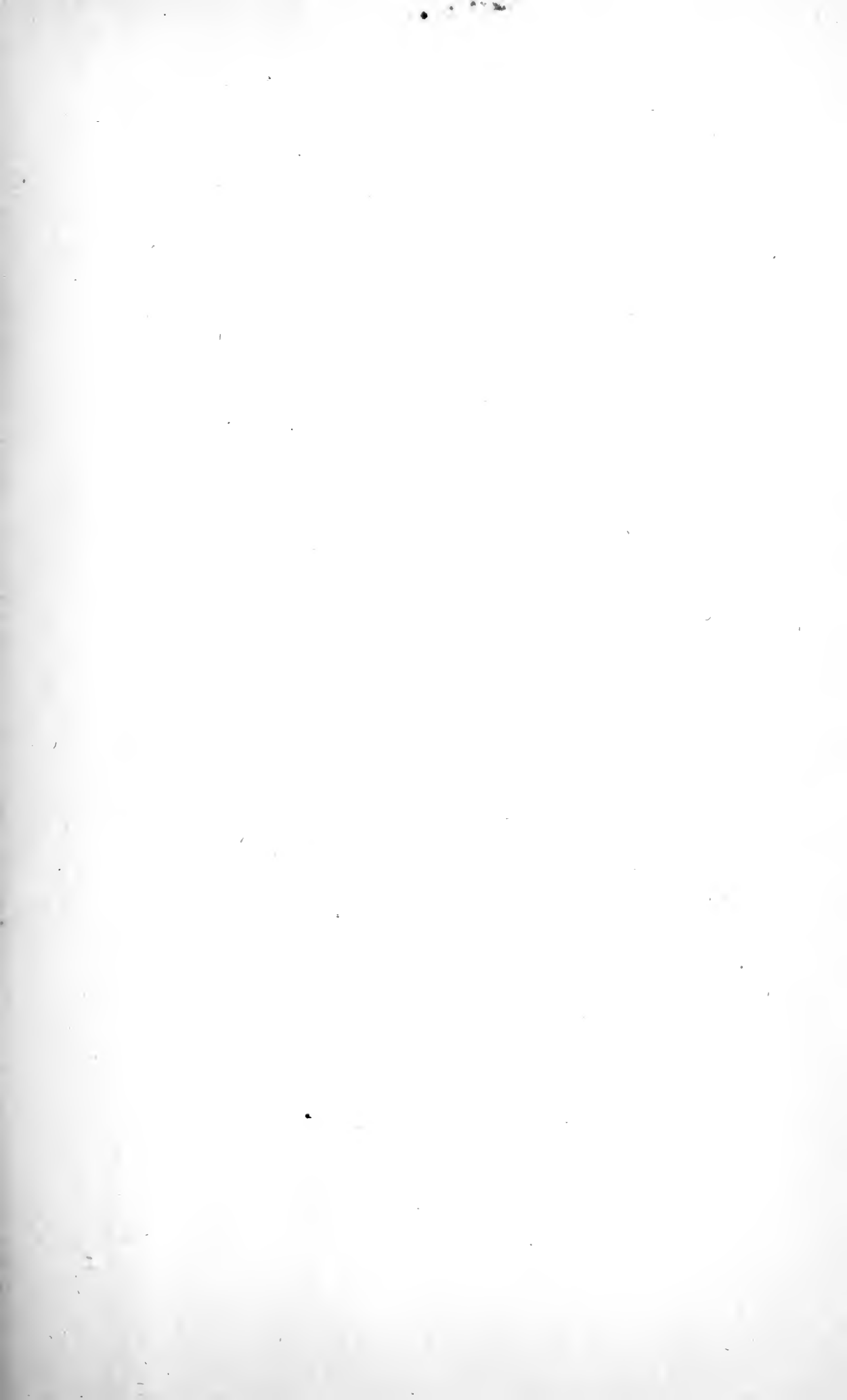
One cannot help feeling that a way must be found, either of making all work developmental, or of relegating to the least fit (as is, theoretically, the method now employed) through a process of selection, all meaningless work, then striving to limit the necessary quantity of that class of work to the lowest possible amount, both for any institution or any individual. Already automatic machines are supplanting the machine-tender and a large part of the machine work now done by unskilled workmen might very readily be done by automatic machines.

On the other hand, the power of organized labor seeks to secure for work of this class higher compensation, with a shorter working day, leaving a part of the day open for leisure. This leisure, however, is generally not cultivated when secured. The working class has not discovered the need of a legitimate avocation, and, usually, does not possess an inclination towards the constructive or even wholesome use of non-working hours.

But our problem is an immediate and pressing one. We are not prepared to substitute automatic machines universally in machine tending operations, nor is the commercial world ready to shorten the work day sufficiently to afford an opportunity for the man engaged in non-expressive work to restore his energies and quicken his faculties in educational activities or by self-expression in an avocation. The solution, if, indeed, but a temporary one, must be found within the factory. It is clear that ordinary machine tending unfits a man for a higher class of work. A man engaged in machine tending for a period of ten years has not the power of readjustment necessary for learning a new means of livelihood. At any given moment, therefore, we must be resigned to a large waste of human capacity, and be satisfied with seeking to make the adult operatives' lives richer along the lines of their personal interests. The educational opportunity lies among the boys, and the nature of the case makes it impossible for the community to properly undertake the education of the factory boy. The community is not prepared to open opportunities for his advancement, and this advancement along the lines of his aptitudes must be an important part of any scheme of education which seeks to raise the mental capacity, or to cultivate the powers of a factory boy. We cannot stimulate his interest and then give it no means of expression. His days are given up to dull work, and, if he is to grow, he must grow out of that work. The problem, then, appears to be one of technical education. Manufacturers are coming to feel their responsi-

bility in this matter, and to appreciate the advantage of educating the men upon whom they must in a large measure depend for commercial success. Principles of good organization prompt a manufacturer to develop his own men to answer his own needs. "I hope to see the day," the superintendent of a large Chicago factory said recently, "when we shall consider it a disgrace to go to New England for managers of our establishments."

The manufacturer is under ethical compulsion to encourage the development of the boys whose work helps his profits. The advanced states have interfered to the extent of prohibiting the employment of children under fourteen in any case, and, under certain conditions, of children under sixteen. The average lad at sixteen has not had time to discover his aptitudes, to train them, and to acquire, in addition, an elementary education. It is a mere extension of the principle of the child labor laws to require that no boy or girl be permitted to devote all of his energies to work which does not cultivate capacity in him. We are slow to weigh the interests of the generation of to-morrow against those of the generation in power. The fault is universal, among bodies of organized labor as well as among capitalists. Here and there, however, a corporation has found it wise to cultivate capacity, usually along the lines of the commercial interest of the particular corporation. An interesting example is the Westinghouse Manufacturing Company, which has opened a school in East Pittsburg for apprentices in its electrical plant, where instruction along electrical lines especially is given after working hours. A smaller company is planning to make attendance at a special school compulsory upon boys employed in its shops during a part of every working day. These manufacturers are realizing what the community will eventually realize, that they cannot afford to increase indefinitely the ranks of unskilled laborers. For America immigration supplies an overplus of inefficiency. American-born children must be taught to do things, must be encouraged in self-expression, even if it costs in wages. It does not seem that we shall need to fear a dearth of men who are unfit for higher work than machine tending. Ethically, the provision of educational opportunities for factory workers is the concern of the community, which owes it to every child in the community that he be given an opportunity for self-expression in his work. Economically, it is vicariously the concern of manufacturers, to whom skill is precious, and intelligent co-operation on the part of employees the *sine qua non* of successful undertakings.





121

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